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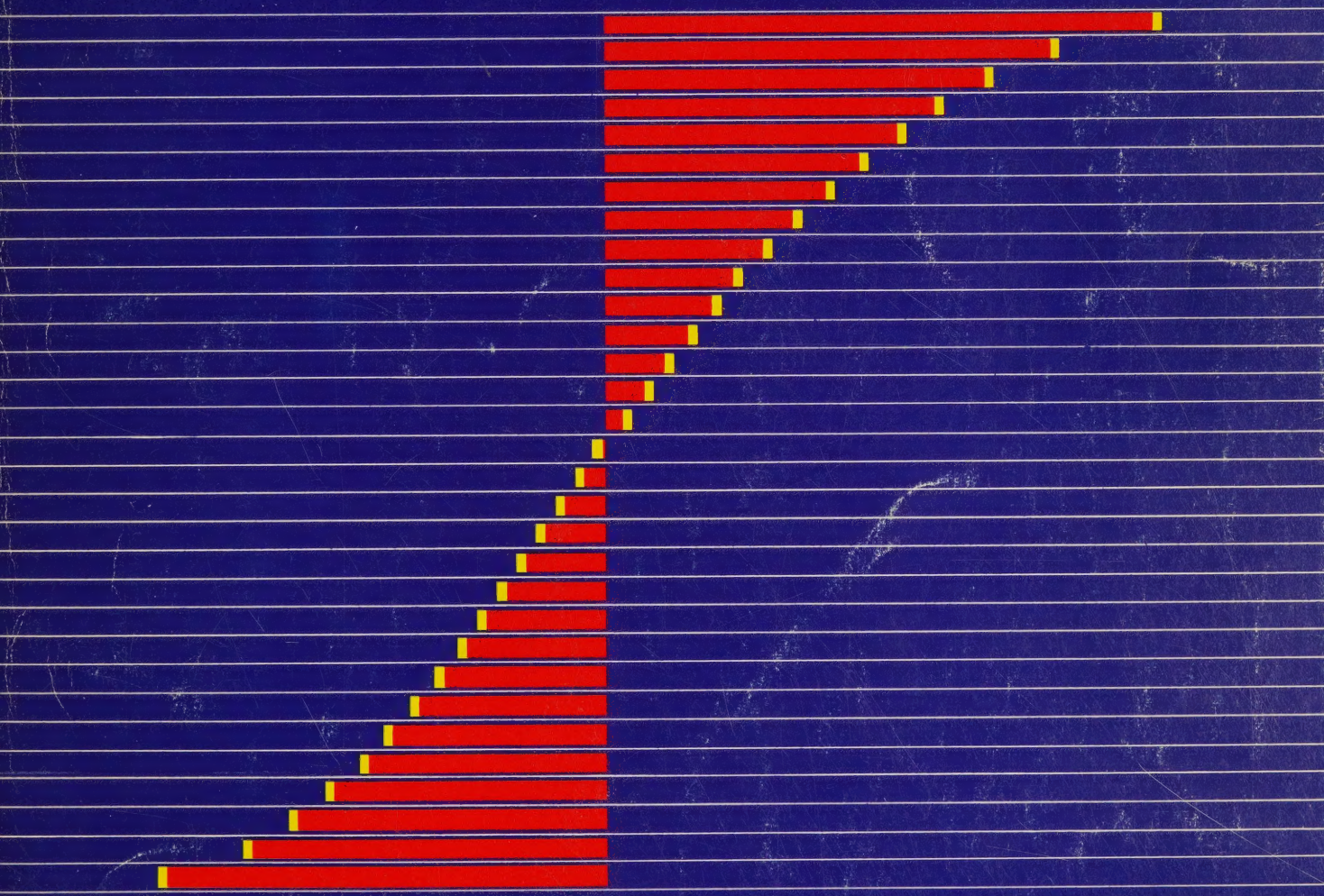
Social Profiles
Quality of Life Measures for Medium-Sized Canadian Cities



NHA 5275 80/10

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Social Profiles: Quality of Life Measures for Medium-Sized Canadian Cities

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The development of this report was carried out for the Ministry of State for Urban Affairs and has been released by the Policy Development and Research Sector of Canada Mortgage and Housing Corporation.

Price: $6.00

Aussi disponible en français.

Canada Mortgage and Housing Corporation
Société canadienne d'hypothèques et de logement

Honourable Paul Cosgrove
Minister

ISBN 0-660-10401-6
Cat. No.: NH73-42/1979

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PREFACE

This report is intended to provide a set of statistical profiles for Canada's medium-sized cities. The profiles are comprised of measures of several dimensions of communities which are seen as contributing to the quality of life in these centres.

As Canada has become increasingly urban in character it has become increasingly important that we have a good information base to assist in understanding our cities. It is hoped that this report will contribute to such a foundation and help provide a basis for monitoring changes over the coming years.

This report provides data on 41 measures contributing to the quality of life in 112 communities with populations of 10 000 to 100 000. It is intended for a broad audience of professionals, local officials, students of urban society and the informed public.

ACKNOWLEDGEMENTS

This report is the product of a study undertaken by the Human Environment Directorate of the Ministry of State for Urban Affairs. It represents an extension and expansion of an earlier report: *"Urban Indicators: Statistical Profiles of Quality of Life for Canadian Cities"* (1978).

Over the course of its production, several people have contributed to the research and this report. Frank Graves assisted in developing the data file and in early analysis. Muriel French prepared tables and graphs. S.Y. Li provided valuable assistance with the computer analysis of the data. Martha Hope and Tony Sroka also assisted in the preparatory work. Special Tabulations were prepared by Statistics Canada.

INTRODUCTION

Since the mid-1960s increasing attention has been devoted to what has come to be called the "quality of life". While this term has rarely, if ever, been precisely defined, it is generally understood to encompass factors which affect the psychological and social well-being of those living in the community. This qualitative focus represents a basic divergence from earlier concentration on quantitative and largely economic factors, but it is usually recognized that basic essentials, such as adequate food and shelter, are prerequisites which must exist before the quality of life can be taken into account. The inclusion of both types of measures, therefore, seems best able to capture an overall notion of quality of life.

One of the greatest difficulties in measuring qualitative aspects of communities is that these factors are much more difficult to put into measurable form. The aesthetic beauty of the surrounding countryside or the sense of "community" found in the neighbourhood may be very important to people's satisfaction with their city; but they are far more difficult to measure than are the number of dollars earned. We make no claims to having solved the problem here. Rather, we have tried to identify and report on factors which contribute to the quality of living in a community.

As Canada's cities have grown, the variety of issues confronting cities and the magnitude of local decisions have also grown. As a result, the need for more information about cities, the kinds and quality of services provided and the utility of facilities available, has become increasingly important.

Comparative information on cities of a certain type or size allows us to identify those urban areas in which real deficiencies exist. Local officials can then proceed to determine which aspects are most in need of responsive social policies and focussed improvements. Information such as that reported here also provides a baseline against which to measure and monitor changes over time.

In the past, most information provided on a city-specific basis has been limited to the largest centres. More specifically, the census metropolitan areas (CMAs) as defined by Statistics Canada, and which now number 23, have been the main focus in the past (see, for example, *Urban Indicators: 1978; Perspective Canada II and III*). In this report we have focussed on the next tier of cities, those with populations of more than 10 000 but fewer than the 100 000 found in CMAs.

The measures we present in this report fall into four categories. The first we call Contextual Data. These measures refer to community characteristics which are not easy to change or control through social policy (e.g., demographic characteristics, locational attributes and climatic conditions). The second category, Physical Development, contains measures of housing and transportation. The third and largest section is devoted to measures of Social Development such as health, education and recreation. In the final section, measures of Economic Development, such as income and employment, are provided.

Within each of our categories or fields of concern we have attempted to provide several kinds of measures. Where it has been possible and appropriate, we have presented measures of supply, demand (or utilization), choice and condition. Thus, for example, we report the supply of physicians, hospital beds and local newspapers; the utilization of public transit and libraries; the choice available in cinemas; and the condition or level of income, fire loss, crime and so on.

The measures included have been selected on the basis of (1) their relevance to the quality of life in medium-sized Canadian cities and (2) their availability at appropriate levels of coverage and aggregation. We have also tried to select measures which can be readily understood by a broad audience. There are, of course, many other measures which are relevant to quality of life but which are not available for our 112 municipalities. While those that we present do not capture the full range of elements affecting quality of life, they do, in our view, measure several key dimensions of quality of life and thus provide a basis of comparison for future measures.

I. CONTEXTUAL DATA

Most of the factors reviewed in this report involve conditions which can be modified by public policy. The contextual measures with which we begin are exceptions. They describe conditions which are generally difficult or impossible to change substantially through social policy. While they differ from those that follow, they provide useful descriptors of the nature of the population and of the setting in which the communities exist.

The fourteen contextual variables are divided into three types: 1) demographic; 2) climatic; and 3) economic-locational.

1. DEMOGRAPHIC

Demographic measures are those which relate to population characteristics such as size, growth rate, migration patterns and related dimensions of population composition. While these are not outcome measures, some, like migration rates, will be affected by other factors which *can* be influenced (e.g., housing costs, unemployment). The importance of these first measures is mainly in providing a description of the context within which other measures operate.

2. CLIMATIC

Climatic factors are beyond our control, but clearly, the amount of sunshine or rain and the severity or moderateness of temperatures affect the quality of life of those who live within those climatic conditions.

3. ECONOMIC-LOCATIONAL

The final type of contextual measures is termed economic-locational. A community's isolation from or proximity to a major centre, the nature of its industrial base and viability are also seen as independent variables which can influence the livability of a community.

II. PHYSICAL DEVELOPMENT

The five physical measures relate to the man-made environment in which people live.

The impact of the built environment is considerable since it involves the immediate surroundings in which urban residents spend most of their time. Aspects of available housing in the community form the main focus of these measures. A second dimension of the physical environment presented here is transportation. Our measures examine both the supply and the demand aspects of public transportation.

1. HOUSING

Perhaps the most important physical factors are those which pertain to the immediate living environment. The type of shelter in which people reside is a key factor in the calculation of quality of life.

In the three housing measures reported, several aspects of the living environment are included: the cost of housing; the extent to which homes are owned rather than rented; and the amount of space and privacy found in homes in the community. In general, the argument is that the more affordable houses are, the more available houses are and the more private and spacious they are, the higher the quality of life. This is based on considerable evidence that, generally, people prefer to own their own houses, to have very ample space and privacy and the opportunity to exercise choice in selecting housing (Michelson 1977; Rossi 1955).

2. TRANSPORTATION

The majority of urban dwellers are dependent on some form of transportation to carry out many of their daily activities. Whether it be for travel to work, to shop or to attend a social gathering, transportation has become an essential element of urban life.

Our measures of transit are the annual revenue kilometres travelled per capita by public transit and the annual number of fare passengers carried per capita by public transit. These measures provide estimates of the supply and demand for public transit. For urban residents who do not have access to automobiles (often the young, the old and the poor) the availability and quality of public transit have significant effects on the quality of life. In addition,

the community as a whole may be affected by the state of public transit. For example, where public transit is in heavy use, problems of pollution, traffic congestion and accidents may be reduced.

III. SOCIAL DEVELOPMENT

The measures of social development form the largest section of this report. The 22 variables include measures of education, health care, cultural and recreational facilities, and of personal safety from crime, traffic injury and fire damage, as well as the availability of local media.

While there are many other social factors which undoubtedly affect the quality of life, those reported here cover a broad range of relevant factors. Some, such as health care or safety, relate to needs which many see as quite basic, while others, such as social and recreational services, measure less essential but, for many people, important components of a desirable community.

1. EDUCATION

Two education measures are presented in this report. The first provides a measure of educational achievement while the second serves to indicate the level of educational service (e.g., pupil/teacher ratio). Education is important both to individuals and to the community as a whole. For individuals, education provides the opportunity to obtain new skills and knowledge which aid in self-development. On the other hand, communities benefit from the skills and knowledge contributed by their residents.

2. HEALTH CARE

The level of health care available in a community is an essential factor in the overall evaluation of a city as a place to live. The difference between a high level of health services and an inadequate level can literally be a matter of life or death. While health services are likely to be more important to specific elements of the population such as the elderly and those with long-term medical difficulties, current concern with health and the many threats to health posed by urban living make this field of services an important aspect of the quality of life.

Two types of measures are included. First, measures of the level of community health services, such as the number of practitioners and hospital beds, are reported. The second type is a measure of the effects of these services at an individual level, specifically on the incidence of infant mortality. It should usually be the case that communities with high levels of health services have low infant mortality rates. However, this relationship does not always hold, since other factors also affect the mortality rate.

3. SOCIAL, CULTURAL AND RECREATIONAL FACILITIES

The four measures reported here cover only a sample of the many factors which could be included under this rubric. The main criterion affecting our selection was the systematic availability of data. Three of the measures report the supply or availability of facilities while one (Public Library usage) addresses the demand for utilization of cultural facilities.

Such facilities are not "essentials" in the sense that health care services are, but they relate closely to the kinds of factors that many people associate with the livability of a community.

4. SAFETY/SECURITY

The measures in this section refer to three types of risk: safety from crime, safety from traffic accidents and safety from fire damage. The inclusion of these measures is based on the fact that high levels of risk to personal safety and security constitute a serious detraction from the quality of life. Physical danger and psychological malaise can constrain the utilization of community facilities. For example, in many U.S. cities a high crime rate deters people from using downtown facilities after dark.

5. COMMUNITY MEDIA

Local media are seen as affecting the quality of life in that they provide local information on and for the community. At the same time they provide a source of local entertainment which may be an important aspect of community life for some.

The two measures reported here provide an indication of the level and choice of local media. Local media can affect both the sense of community identity and the amount of local involvement open to residents. In addition, the media can be expected to provide information on and be sensitive to local sentiments. They can, therefore, provide a useful, two-way flow of information and opinion which can bring about a greater sense of involvement in local affairs and decisions affecting daily life.

IV. ECONOMIC DEVELOPMENT

The measures presented in this section relate to the economic prosperity and employment of the residents of our communities. Although only four measures are presented, it should be clear that economic and employment status have important consequences for the quality of life. Put bluntly, the greater one's economic resources, the more of the "good" things in life one can afford to enjoy and the more disagreeable circumstances one can manage to avoid. Since most people's economic standing is primarily a function of the income they obtain from employment, employment status also has major consequences for the quality of life.

The two measures reported which pertain most directly to residents' economic prosperity are both income measures. O of these provides data on the level of disposable income which individuals receive while the other reports the avera income received by families.

The remaining two measures bear on t level of employment. The first provides t unemployment rate in the communities studied while the second gives the rate o female participation in the labour force.

ORGANIZATION OF THE REPORT

The report is composed of four sections which correspond to the four categories measure discussed in the introduction: Contextual, Physical Development, Socia Development and Economic Developme Within each of these main sections, measures are further divided into subgroupings. For example, the section on physica development contains two groups of mea sures, housing and transportation, each o which has its own introduction to discuss the relevance of the measures as indicato of the quality of life. Finally, each measure is discussed independently. Covered in this discussion are: the nature of the measure (what it indicates vis-à-vis the quality of life, its definition and computation); difficulties that occur in interpreting the measure; identification of national and regional patterns evident in the data, alon with some interpretation; and other measures that might be considered in future efforts to develop indicators of the quality of life. Finally, a histogram comparing standardized scores is presented as a visua aid to the discussion of patterns. The histograms for measures beginning with number 2, percentage population change, utilize Z scores as a means of conveying standardized distributions. For an explana tion of this, see Footnote 6, page 17.

EMOGRAPHIC STRUCTURE: POPULATION SIZE, CHANGE, COMPOSITION

Fundamental to the character of a city are the size and composition of its population. The number of people residing in a centre has many implications for the functions it performs. The population of a city serves in many capacities: a labour supply for local firms; a consumer market for retail outlets; a client group for community facilities/services; a source of public revenue through taxation. Further, the composition of a community's population, its age-sex structure, the size of households and the degree of ethnic diversity may exert a significant impact on the nature of the infrastructure and services found in the city. For example, a large, school-aged population necessitates heavy expenditures on educational programs while an aging population requires more extensive provision of certain health care and social services. Similarly, an increase in smaller, non-family households could prompt a shift in the housing market towards the supply of smaller apartment and townhouse dwellings. The presence of ethnic minorities typically manifests itself through an array of institutions and services (e.g., newspapers, religious organizations, voluntary associations, stores, festivals) specifically geared to the needs of a particular ethnic or language group. Clearly, the demographic structure and community-service base of a city go hand-in-hand.

The population size and composition of a community are shaped by the levels of natural increase (births less deaths) and net migration (in-migrants less out-migrants). Although the population growth of Canada since Confederation has been fuelled primarily by an excess of births over deaths, the distribution of population among the nation's urban centres largely stems from the prevailing patterns of migration within the country as well as from the proclivity of immigrants to flow into a few selected destinations. More pronounced, however, than the numerical impact of net migration on a city's population are the systematic differences of in-migrants compared to out-migrants in terms of age, sex, ethnicity and occupation which strongly influence its demographic structure, shaping its age-sex composition, its ethnic elements and its occupational profile.

Perhaps surprisingly, the rate of population change experienced by a city is, in the short run, more significant to the quality of life enjoyed by its residents than is its overall population size. Sudden shifts in municipal population levels can create imbalances in the supply and demand for jobs, housing and community infrastructure, causing either excessive demand with its associated bottlenecks in supply, or lagging demand with an undesired degree of slack among suppliers. A rapid rise in municipal population can result in overcrowding, congestion and reduced availability of services. Conversely, a sudden or prolonged decrease in a community's population level can precipitate a deterioration of infrastructure, a cutback in services and reduced property values. Although the size of a centre principally dictates the breadth of facilities and services available over the long run, short-term adjustment problems in service provision provoked by sizeable population changes can markedly affect the quality of life experienced by a community's residents.

Each of the demographic dimensions, which include population size, rate of change, age structure, population turnover and ethnic diversity, is discussed in turn.

The size of an urban centre has a multitude of consequences for the quality of life experienced by its residents. Large cities provide their inhabitants with greater choice for employment, housing and lifestyle. The broad economic base of bigger centres offers a diversity of job opportunities. The larger market supports a more complete range of retail outlets, restaurants, entertainment and cultural facilities to suit different tastes. The sizeable client group justifies the emergence of specialized services such as higher-order educational institutes and medical centres. Varied living environments, different housing types and neighbourhoods and a wider range of social contacts are available to the residents of large centres.

On the other side of the ledger, a number of negative features are associated with bigness: pollution, noise, congestion and lengthy commuting times among others. Residents of larger centres are also hit in the pocketbook. Increases in public expenditures are required in order to provide public services such as transit and major arterial roads, services seldom needed in smaller places but absolutely vital to larger ones.

A similar balance sheet exists for smaller centres. On the "plus" side of small town life are improved access to open space and natural areas, freedom from congestion and high-density living environments and a slower pace of life. But, for many, the quality of life in smaller places may be far from idyllic. There may be a lack of public services, limited consumer choice, a dearth of interesting employment opportunities, inherent economic instability and closed, intolerant social relations.

Given the mixed blessings of both larger and smaller cities, the identification of an optimum city size that provides a satisfactory quality of life for most residents has proven elusive. For example, some writers have suggested that a minimum city size of say 100 000 to 250 000 is necessary to support industry, supply services and accommodate diverse lifestyles[1]. Nevertheless, to a considerable degree, the quality of urban life is in the eye of the beholder. Indeed, some people prefer to capture the best of both worlds by residing in small towns or hamlets at the edge of a bustling metropolis. Since individuals differ greatly, urban development policies must also ensure that Canadians are accorded a real choice in the size and nature of communities in which they may want to live. The population size of each city in 1976 is presented.

[1]Niles M. Hansen, "Criteria for a Growth Center Policy", in A. Kuklinski (ed.), *Growth Poles & Growth Centres* (The Hague: Mouton, 1972), pp. 103-124.

TABLE 1. POPULATION (1976) (ESTIMATE BASED ON 1971 URBAN AREA BOUNDARIES)

ATLANTIC REGION	Bathurst	16,301	Moncton*	78,831
	Campbellton*	11,144	Newcastle*	20,019
	Charlottetown*	24,850	New Glasgow*	23,532
	Corner Brook	25,197	Oromocto	10,276
	Edmundston	11,685	Summerside*	14,144
	Fredericton*	40,644	Sydney*	88,610
	Grand Falls*	15,077	Sydney Mines*	35,421
	Kentville*	12,254	Truro*	28,327
	Labrador City*	15,780		
QUÉBEC REGION	Alma	23,240	Rivière-du-Loup	13,094
	Asbestos*	14,395	Rouyn*	27,487
	Baie-Comeau*	26,634	Saint-Georges*	14,997
	Cowansville	11,901	Saint-Hyacinthe*	40,201
	Dolbeau*	12,432	Saint-Jean*	50,234
	Drummondville*	44,903	Saint-Jérôme*	36,486
	Gaspé	16,841	Sept-Îles	30,616
	Granby*	41,487	Shawinigan*	53,488
	Joliette*	30,115	Sherbrooke*	90,576
	Lachute*	14,856	Sorel*	35,028
	La Tuque	12,067	Thetford Mines*	25,302
	Magog*	14,597	Trois-Rivières*	98,583
	Matane	12,717	Val-d'Or*	21,465
	Montmagny	12,326	Valleyfield*	37,603
	Rimouski*	30,225	Victoriaville*	27,614
ONTARIO REGION	Arnprior*	10,654	Midland*	26,231
	Barrie*	49,209	North Bay	51,639
	Belleville	35,310	Orillia	24,411
	Brantford*	82,791	Oshawa*	135,195
	Brockville	19,902	Owen Sound	19,524
	Chatham	38,655	Pembroke*	18,418
	Cobourg*	20,255	Petawawa*	14,326
	Cornwall	46,121	Peterborough*	65,293
	Guelph*	70,366	Sarnia*	81,336
	Haileybury*	12,596	Sault Ste. Marie*	81,920
	Hawkesbury*	11,091	Simcoe	11,807
	Kapuskasing	12,675	Smiths Falls*	13,327
	Kenora*	12,519	Stratford	25,657
	Kingston*	90,740	Timmins*	43,184
	Kirkland Lake	13,567	Trenton*	32,633
	Leamington	11,168	Wallaceburg	11,131
	Lincoln	14,460	Woodstock	26,778
	Lindsay	13,062		
PRAIRIES REGION	Brandon	33,237	Portage la Prairie	12,554
	Flin Flon*	10,306	Prince Albert	28,631
	Grande Prairie	17,421	Red Deer	32,172
	Lethbridge	46,751	Swift Current	14,264
	Medicine Hat*	35,787	Thompson	17,291
	Moose Jaw	32,555	Yorkton	14,118
	North Battleford*	16,124		
BRITISH COLUMBIA REGION	Chilliwack*	37,487	Port Alberni*	26,270
	Courtenay*	18,882	Powell River	13,693
	Cranbrook	13,509	Prince George*	59,607
	Dawson Creek	10,528	Prince Rupert*	15,676
	Kamloops*	54,601	Terrace*	14,653
	Kelowna*	47,884	Trail*	15,646
	Kitimat	11,955	Vernon	16,683
	Nanaimo*	45,621	Williams Lake*	15,879
	Penticton	21,343		

*Denotes Census Agglomeration as defined in 1971.
SOURCE: Calculations based on: Statistics Canada, *1976 Census of Canada, Population: Geographic Distributions*, Cat. 92-806 (Ottawa: 1977); Statistics Canada, *1971 Census of Canada, Population*, Cat. 92-708 (Ottawa: 1973).

ASPECT MEASURED

The population size of an urban centre is a broad determinant of the overall demand for goods and services in the urban area, the range of facilities and functions that it can support and the labour force available to industry.

For purposes of consistency throughout the study, the levels cited for all indicators refer, where possible, to the 1971 geographic boundaries of the census agglomeration or municipality. Hence, the figures listed are estimates of the 1976 population residing within the 1971 boundaries of the urban area.[2]

URBAN PATTERN

Although only urban centres of 10 000 to 100 000 population are considered in this study, these cities conform to the basic spatial pattern of Canada's urban system. A significant number of these cities are situated in two major clusters around Toronto and Montréal, while the rest are thinly strung out across the country. Of the 112 places included in the study, 48 are located along "Canada's Main Street", the corridor stretching across southern Ontario and southern Québec from Windsor to Québec City.[3]

The economic structure and linkages between places in this region, which is often called Canada's heartland, contrast sharply with those of cities in the nation's hinterland. For the most part, diversified manufacturing is the dominant economic activity for places along the Windsor-Québec Axis while transportation and wholesale-retail distribution employ much of the labour force in hinterland cities which face the problem of considerable distances and a thinly spread population engaged in primary activities such as forestry, mining and agriculture. Typically, centres based on mineral and forest resources are largely isolated from the remainder of Canada's urban system, being situated along the Canadian Shield or in the Rockies.

OTHER MEASURES

Aside from population size, there are many other measures of urban scale. Physical measures of size include the land area encompassed by a city, the number of dwelling units, the miles of road constructed and other data on basic infrastructure. The economic and social correlates of size are also multifold. The volume of retail sales, the size and range of retail/service establishments, the diversity of the industrial base, the extent of unemployment and the level of family income are influenced by the size of the city.

[2]Data for unemployment, female labour force participation, age dependency ratios and housing tenure refer to the 1976 geographic boundaries of census agglomerations and municipalities.

[3]Yeates, Maurice, *Main Street: Windsor to Quebec City*. (Toronto and Ottawa: Macmillan in association with the Ministry of State for Urban Affairs, 1975).

In many instances, the rate of growth rather than the absolute size of a community more strongly influences the quality of life experienced. The establishment of a new firm and the resulting injection of new households and money into the community can brighten the local economic climate through increased purchases from local merchants, enhanced demand for housing and a strengthening of the municipal tax base from which community services are provided. Moreover, the benefits accruing to the community can extend beyond the initial expenditure of funds by the new employees. As the money expended percolates throughout the local economy from retailers to suppliers to producers, from taxes paid to services rendered to wages received and so to further consumer purchases, the effects of the initial injection of jobs and money are multiplied.[4] If the multiplier effect exerts a strong impact on the local economy, then, as new market thresholds are achieved, the community may undergo a permanent expansion in its housing stock, in its array of retail outlets, restaurants and entertainment areas and in its inventory of schools, parks and medical facilities, all of which may enhance consumer choice and improve the quality of life.

The salutary influences of robust economic growth on the quality of life are, however, often mitigated in the short run by the effects of an overheated local economy. Sudden population increases can place excessive demand on community infrastructure and services causing supply shortages. High housing prices, doubling up in existing accommodation, long waiting periods for use of health services or recreational programs and shortages of retail goods can result in the short run. Such problems are most likely to occur during the initial boom years of a pioneer resource town (e.g., Thompson, Labrador City) and tend to even out as time passes.

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[4]The multiplier effect in the local economy can be substantially diminished by "leakages" of funds to external suppliers in each successive round of spending. Smaller cities which rely heavily on outside firms and agencies for goods and services lose much of the momentum provided by new investment as consumer expenditures and secondary investments are diffused to other regions.

In more established centres where a sound infrastructure base already exists, short-run problems arising from population growth are likely to be less severe. Nonetheless, population pressures can complicate the orderly, planned expansion of an urban centre. A few of the possible ramifications arising from unbridled growth are: the irreversible conversion of land eminently suited for food production to urban purposes; the competition for scarce, urban land resources and its resulting price escalation; low-density suburbanization and associated traffic congestion generated by the excessive use of the automobile; ill-conceived and poorly located development which gives little recognition to requirements for the natural environment; and rapid increases in public expenditure for certain public services.

The cumulative effects of a sudden decline in local economic activity and the resulting population loss can have a devastating impact on a community. The loss of a large industry with the attendant reduction in employment, investment an money in circulation can stagger a local economy, depleting all its sectors: retailing, wholesaling, transportation, persona and business services, housing and construction, community services. The closu of an industry or an economic downturn i most acutely felt in isolated, single-industry towns in which the main employer ma be faced with the triple threat of a fading product, an obsolete technology and an old, rigid-management hierarchy. Economic instability, with its unhappy co sequences for the quality of life, is a perva sive feature of many small Canadian cities and towns that rely heavily on resource exploitation or a single manufacturing enterprise for their livelihood.

It is apparent, then, that the causes of population change in a community and its consequences in terms of the quality of life, whether experienced under the opposing conditions of boom or bust or simply as a steady prolonged expansion, represent a complex, multifaceted topic.

ERCENTAGE POPULATION CHANGE (1971-76)

SPECT MEASURED

Population gains or losses experienced over the five-year period, 1971 to 1976, are expressed as a percentage of the 1971 population total for each centre. The rate of change was determined by use of a constant geographic area, the 1971 census urban area definition, for each place. Hence, population changes resulting from annexation, amalgamation and other alterations to municipal boundaries were excluded. Only actual population increases (or decreases) arising from natural increase or net migration are considered.

RBAN PATTERN

On a national basis, the five-year rates of population change for medium-sized communities were extremely volatile, covering the full spectrum from massive gains (43.3 per cent in Labrador City) to precipitous decline (-11.4 per cent in Dawson Creek). Although the average ($\bar{X}$) five-year growth rate by region increases progressively from east to west, variations among cities within regions are more significant, as evidenced by the high standard deviations (S) recorded for each region.[5]

Patterns of urban population change cannot be understood without knowledge of shifts in the economical base for urban centres. Resource-based boom-towns on the northern frontier generally experienced the most dramatic population increases (e.g., Labrador City, Sept-Îles, Val-d'Or, Grande Prairie, Prince George, Williams Lake). Robust growth has also occurred in centres that lie within the economic orbit of mushrooming metropolitan areas such as Toronto and Vancouver (e.g., Barrie, Oshawa, Chilliwack).

Conversely, places suffering moderate or severe population decline included established mining communities that are facing a depleted resource base or reeling from the vagaries of world resource markets (e.g., Asbestos, Thetford Mines, Flin Flon, Thompson). Other communities struck by population losses are typically those which rely on a single firm for their existence. In such circumstances, if the individual manufacturer suffers a setback due to aging capital equipment, obsolete technology or a drop in world demand for the firm's product, then the consequences for the one-industry town are immediate and substantial. Among the hardest hit places of this type have been pulp and paper or lumbering communities (e.g., Edmundston, Campbellton, Corner Brook, La Tuque, Shawinigan, Pembroke, Kirkland Lake) as well as the older, metal-processing centres (e.g., Sydney, Trail).

[5] *Mean* ($\bar{X}$): a statistical measure of central tendency, the arithmetic average for all cases. Operationally, it is the sum of scores divided by the total number of cases involved.
Standard Deviation (S): a statistical measure of the average dispersal for all cases in a distribution. Operationally, it is the square root of the squared deviation scores about the mean of a distribution. The greater the spread of scores about the mean, the higher the standard deviation.
N: the number of cases (or places) in a distribution for which statistics have been computed.

a) Overall aggregate values	Percentage population change		
Mean ($\bar{X}$)	4.9		
Standard deviation (S)	10.3		
Maximum	43.3		
Minimum	-11.4		
b) By region	$\bar{X}$	S	N
Atlantic	3.3	12.3	17
Québec	2.6	6.8	30
Ontario	4.0	7.2	35
Prairies	6.2	12.8	13
British Columbia	11.5	14.3	17

OTHER MEASURES

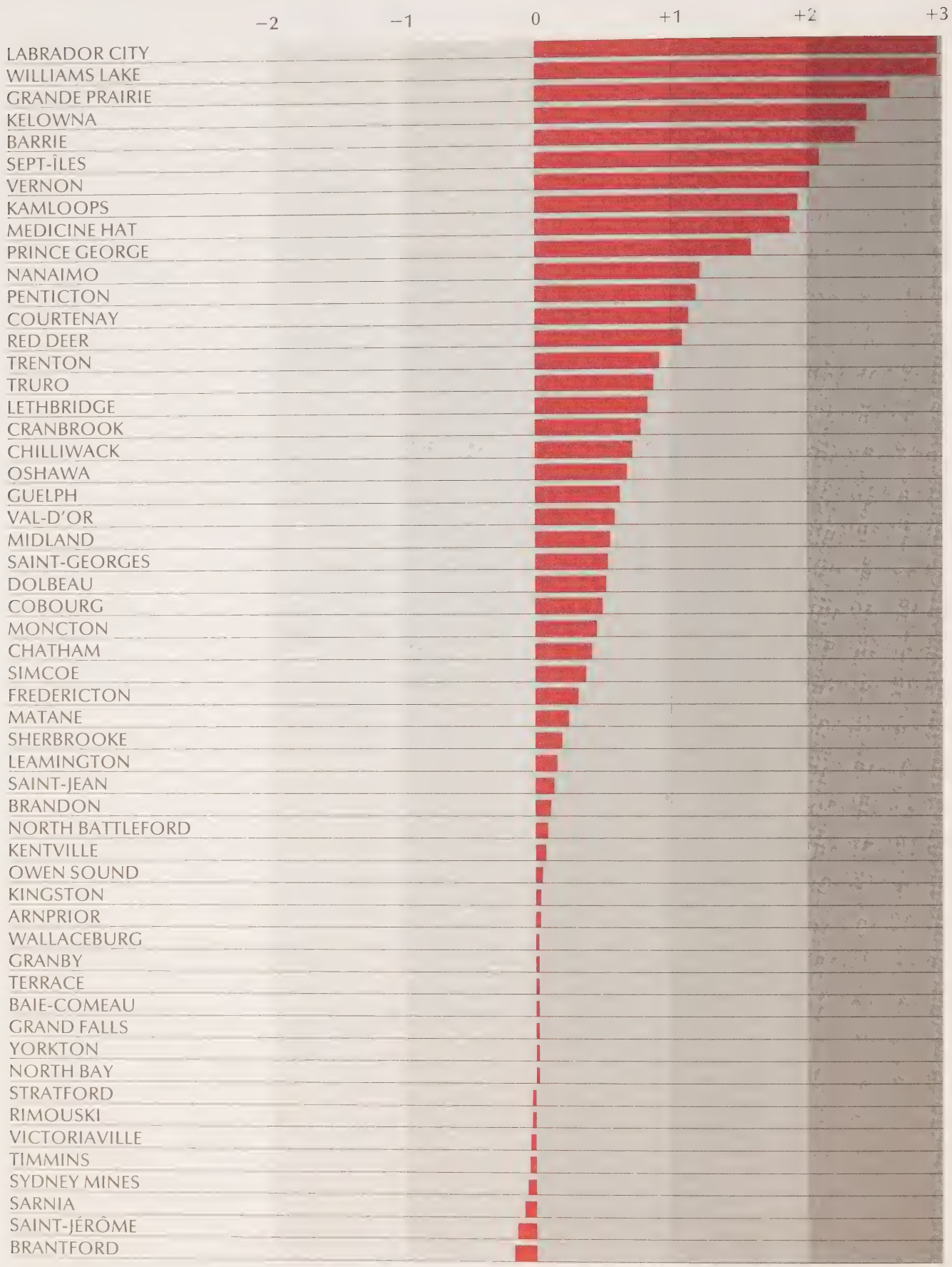
The change in scale of many of the physical, social and economic aspects of city life can be usefully measured. As an illustration, the rate of change in the provision of physical infrastructure, the range of social and recreational services available and the number of retail establishments in business may be determined in order to assess the impact that population growth or decline exerts on these sectors. The interrelationship of labour force participation rates, unemployment levels and family income with population change rates is another fruitful area of inquiry. For the land-use planner, the effect of population growth on the demand for serviced land and new housing is a critical concern.

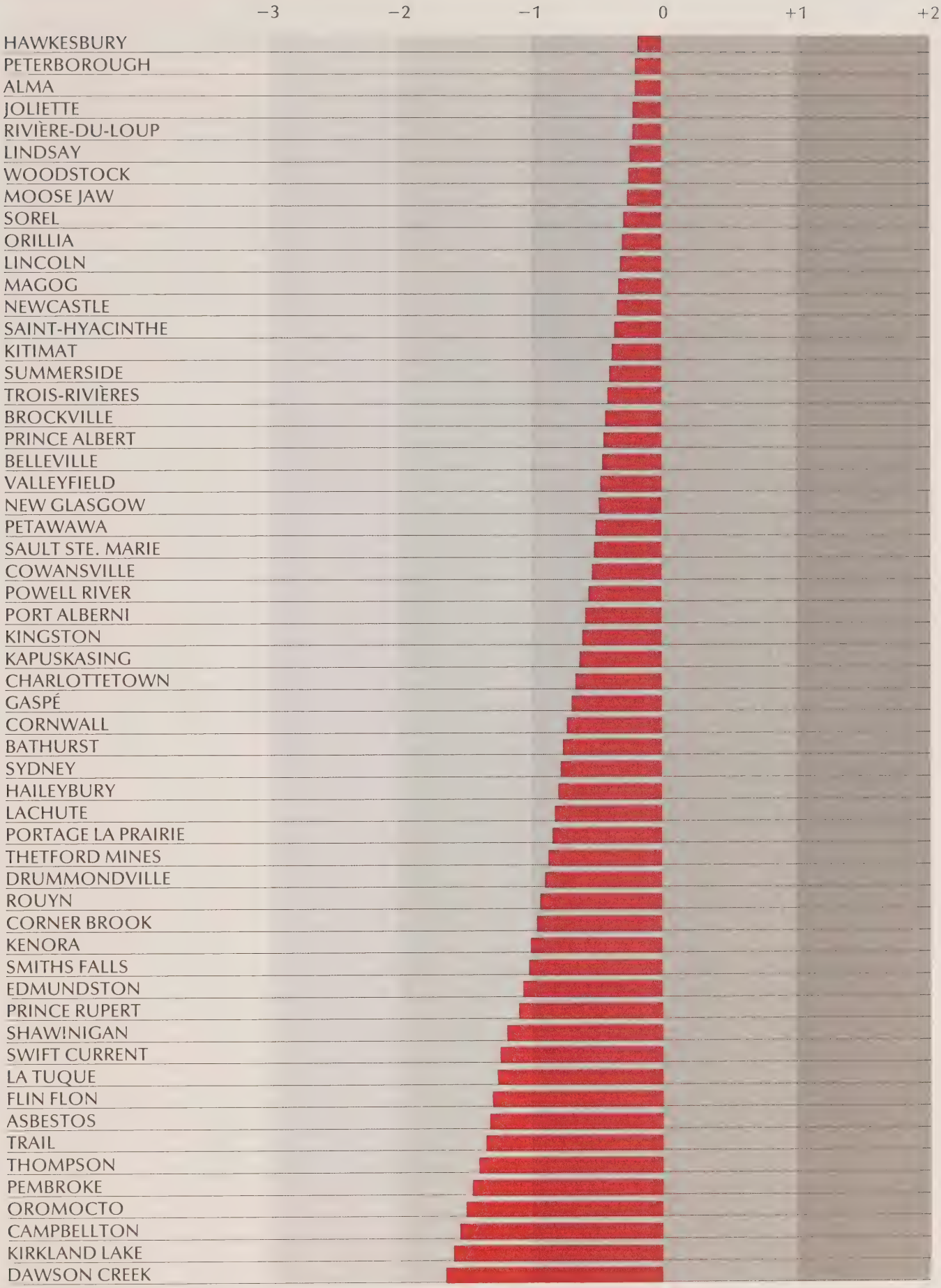
TABLE 2. PERCENTAGE POPULATION CHANGE (1971-76) (BASED ON CONSTANT 1971 URBAN AREA BOUNDARIES)

ATLANTIC REGION	Bathurst	−2.2	Moncton*	10.4
	Campbellton*	−10.4	Newcastle*	1.3
	Charlottetown*	−1.6	New Glasgow*	0.4
	Corner Brook	−4.2	Oromocto	−10.1
	Edmundston	−5.5	Summerside*	1.0
	Fredericton*	7.9	Sydney*	−2.8
	Grand Falls*	5.3	Sydney Mines*	4.1
	Kentville*	5.9	Truro*	13.7
	Labrador City*	43.3		
QUÉBEC REGION	Alma	2.7	Rivière-du-Loup	2.6
	Asbestos*	−8.2	Rouyn*	3.8
	Baie-Comeau*	5.3	Saint-Georges*	10.7
	Cowansville	−0.2	Saint-Hyacinthe*	1.3
	Dolbeau*	10.7	Saint-Jean*	6.8
	Drummondville*	−3.5	Saint-Jérôme*	3.3
	Gaspé	−2.1	Sept-Îles	25.9
	Granby*	5.5	Shawinigan*	−6.6
	Joliette*	2.6	Sherbrooke*	7.1
	Lachute*	−2.9	Sorel*	1.6
	La Tuque	−7.9	Thetford Mines*	−3.2
	Magog*	1.5	Trois-Rivières*	0.7
	Matane	7.4	Val-d'Or*	12.1
	Montmagny	−0.9	Valleyfield*	0.5
	Rimouski*	4.4	Victoriaville*	4.1
ONTARIO REGION	Arnprior*	5.6	Midland*	11.6
	Barrie*	28.9	North Bay	4.9
	Belleville	0.5	Orillia	1.5
	Brantford*	3.1	Oshawa*	12.4
	Brockville	0.7	Owen Sound	5.7
	Chatham	9.5	Pembroke*	−9.3
	Cobourg*	10.6	Petawawa*	0.3
	Cornwall	−2.1	Peterborough*	2.8
	Guelph*	12.3	Sarnia*	3.7
	Haileybury*	−2.8	Sault Ste. Marie*	0.8
	Hawkesbury*	3.0	Simcoe	9.4
	Kapuskasing	−1.2	Smiths Falls*	−5.1
	Kenora*	−4.2	Stratford	4.7
	Kingston*	5.7	Timmins*	4.1
	Kirkland Lake	−10.8	Trenton*	13.9
	Leamington	7.0	Wallaceburg	5.5
	Lincoln	1.5	Woodstock	2.3
	Lindsay	2.5		
PRAIRIES REGION	Brandon	6.7	Portage la Prairie	−3.1
	Flin Flon*	−8.0	Prince Albert	0.6
	Grande Prairie	33.2	Red Deer	16.3
	Lethbridge	13.4	Swift Current	−7.5
	Medicine Hat*	24.4	Thompson	−9.0
	Moose Jaw	2.2	Yorkton	5.1
	North Battleford*	6.4		
BRITISH COLUMBIA REGION	Chilliwack*	12.5	Port Alberni*	−0.9
	Courtenay*	16.8	Powell River	−0.2
	Cranbrook	12.6	Prince George*	21.4
	Dawson Creek	−11.4	Prince Rupert*	−6.5
	Kamloops*	24.7	Terrace*	5.4
	Kelowna*	29.6	Trail*	−8.9
	Kitimat	1.3	Vernon	25.6
	Nanaimo*	17.7	Williams Lake*	39.2
	Penticton	17.6		

*Denotes Census Agglomeration as defined in 1971.
SOURCE: Calculations based on: Statistics Canada, *1976 Census of Canada, Population: Geographic Distributions*, Cat. 92-806 (Ottawa: 1977); Statistics Canada, *1971 Census of Canada, Population*, Cat. 92-708 (Ottawa: 1973).

GRAPH 1. PERCENTAGE POPULATION CHANGE (1971-76)




−3
−2
−1
0
+1
+2
HAWKESBURY
PETERBOROUGH
ALMA
JOLIETTE
RIVIÈRE-DU-LOUP
LINDSAY
WOODSTOCK
MOOSE JAW
SOREL
ORILLIA
LINCOLN
MAGOG
NEWCASTLE
SAINT-HYACINTHE
KITIMAT
SUMMERSIDE
TROIS-RIVIÈRES
BROCKVILLE
PRINCE ALBERT
BELLEVILLE
VALLEYFIELD
NEW GLASGOW
PETAWAWA
SAULT STE. MARIE
COWANSVILLE
POWELL RIVER
PORT ALBERNI
KINGSTON
KAPUSKASING
CHARLOTTETOWN
GASPÉ
CORNWALL
BATHURST
SYDNEY
HAILEYBURY
LACHUTE
PORTAGE LA PRAIRIE
THETFORD MINES
DRUMMONDVILLE
ROUYN
CORNER BROOK
KENORA
SMITHS FALLS
EDMUNDSTON
PRINCE RUPERT
SHAWINIGAN
SWIFT CURRENT
LA TUQUE
FLIN FLON
ASBESTOS
TRAIL
THOMPSON
PEMBROKE
OROMOCTO
CAMPBELLTON
KIRKLAND LAKE
DAWSON CREEK

COMPOSITION: AGE STRUCTURE

There are few aspects of the quality of life in cities that remain unaffected by age structure. A city's unemployment and labour force participation rates, crime and accident rates, its church attendance, hospital occupancy, home ownership and growth rates all need to be understood in terms of the age composition of its inhabitants.

Demand for public services, facilities and programs is intimately linked to the age profile of the local population. The extent and proportion of apartments, row, and single-detached housing required in a particular city is, for example, closely related to the percentage of singles, families and elderly people residing therein. The proportionate need in a city for nurseries or nursing homes, chronic care units or community playgrounds, day-care facilities or drop-in centres, as well as other municipal services, is largely a consequence of age composition. Moreover, the costs borne and benefits derived in a particular centre from many senior government programs such as family allowances, pension plans and, even less explicitly, age-selective programs like housing assistance programs are very much dependent on the centre's age profile.

Moreover, the future demand for facilities and programs is, to a considerable degree, built into the present age structure. An unusually large number of young couples in a city suggests that future school expenditures may be high. A community in which many are approaching retirement age points to the need for an increase of senior citizens' programs a few years down the road. On a national basis, the consequences of the high birth rates of the late 1940s and early 1950s, the so-called "baby boom", was first felt in the elementary schools, next in the universities, then in the job markets, and, barring an unforeseen catastrophe, will ultimately place heavy demands on health facilities, leisure programs and pension plans sometime after the year 2000.

The causes underlying the existing age structure of a community and the projection of its future composition are a matter of some complexity. Although the age-specific death rate in Canada has gradually declined, the age-specific fertility rate has soared and plummeted in recent decades. Since the 1950s, the general re-orientation of women's role in society, fears about over-population and worries about the high cost of raising children have caused a massive shift in attitudes towards family size. More complex, however, are patterns of internal and international migration. Each jolt to the urban economy, such as the opening of a factory or the closing of a military installation, leaves its mark on a city's age structure since the streams of in-migrants and out-migrants that respond to such events are highly selective according to age. The age profile of a place reflects, therefore, the cumulative changes in its local economy as well as national and regional trends in fertility and mortality rates.

Although the factors affecting a community's age structure are complex, its impact on the demand for community facilities and services, and hence the quality of life, are of considerable significance. As a result, two contextual measures of age structure are presented: the youth dependency ratio and the old-age dependency ratio.

YOUTH DEPENDENCY RATIO (1976)

ASPECT MEASURED

The youth dependency ratio measures the size of the child population as a proportion of the mostly-working-age population. The ratio is the number of persons aged 0 to 14 in each community who are not in the labour force, divided by the number of persons aged 15 to 64 who potentially can be members of the labour force. The notion of dependency is emphasized since children depend on the resources of the adult population to satisfy their needs for health, food and shelter. On a community-wide basis, a higher proportion of children increases the demand for schools, playgrounds, day-care and medical services. A high youth dependency ratio in a community also suggests that some families may be experiencing financial difficulties as the family income must support a larger number of dependents.

URBAN PATTERN

Regional means range from a low of .37 in Québec to a high of .45 in the Atlantic urban areas. Ontario, the Prairies and British Columbia fall in between these extremes with respective means of .39, .40 and .42. Although the differences are moderate, the proportion of the population under 14 is, on average, proportionately larger in the Atlantic and B.C. centres.

Comparison of dependency ratios by provincial regions masks significant fluctuations between communities in the proportionate size of the child population. For the most part, those centres which have large percentages of young people are small in size and situated in the nation's hinterland, where economic activity largely focusses on primary production and transportation-distribution functions. When the youth dependency ratio is normalized[6] and the scores ranked, it is discovered that the majority of cities which score -1.0 or higher are located outside the Windsor-Québec City Axis and have relatively small populations (see Graph 2).

Urban centres with a proportionately high number of children are by no means a uniform group. Characterized by the virtual absence of people over age 45, the two military towns of Oromocto and Petawawa have very youthful age structures. Also notable for their youthful age composition are centres experiencing rapid population growth, either directly due to the expansion of resource extraction or processing activities (e.g., Labrador City, Prince George, Val-d'Or) or indirectly through provision of transportation and wholesale distribution functions to booming resource regions (Sept-Îles). To a large extent, such centres have attracted mobile, young families in search of lucrative employment and business opportunities, but they have relatively few long-term residents in the older age groups. But the urban pattern is not clear. Other resource and distribution centres with a youthful age profile have recently experienced a minimal gain or an outright decline in population (e.g., Corner Brook, Kapuskasing, Thompson).

[6]A mathematical transformation described as follows:

$$Z = \frac{x - \bar{X}}{S}$$

Where:
- Z = the normalized value for an individual case (e.g., an urban centre)
- x = the original value for an individual case
- $\bar{X}$ = the mean of the distribution for the variable (e.g., Youth Dependency Ratio)
- S = the standard deviation of the distribution.

For a normal distribution, $\bar{X} = 0$ and $S = 1$, and the unit of measurement is the standard deviation. When a statistical distribution has been transformed into a normal curve, the proportion of cases in the distribution that theoretically should lie between two fixed points under the curve is known.

Clearly, the explanation of demographic composition and change at the level of the individual city involves a range of factors, some of which are the city's occupational structure, its degree of economic prosperity, its age-specific migration rates and its fertility rates.

Several factors must also be taken into account to understand why some cities have proportionately fewer children. The disparate locations, economic functions and demographic profiles exhibited by places that have low youth dependency ratios attests to this multiplicity of factors at work. In contrast to cities with youthful age structures, communities with a below-average proportion of children are located primarily in southern Ontario and southern Québec. Not surprisingly, retirement communities for the elderly from surrounding rural areas (e.g., Simcoe, Stratford, Moose Jaw, Vernon, Penticton), generally have fewer children, while university towns (e.g., Kingston, Fredericton), in which a high proportion of young single adults reside, also have a smaller child population. Further, the economic climate may also affect the demographic composition of a city within the economic heartland. The low dependency ratios found in the old manufacturing centres (e.g., Brockville, Sorel, Smiths Falls, Saint-Hyacinthe) located near large metropolitan areas reflect, in part, the propensity of young adults in their child-bearing years to leave the lower paying jobs of an aging industrial centre to seek their fortune in the metropolis.

As is apparent from this brief review the spatial pattern of the age composition for Canada's medium-sized cities results from the dynamic interplay of a whole series of processes including fertility rates, the economic climate, the industrial structure and migration in response to perceived opportunities.

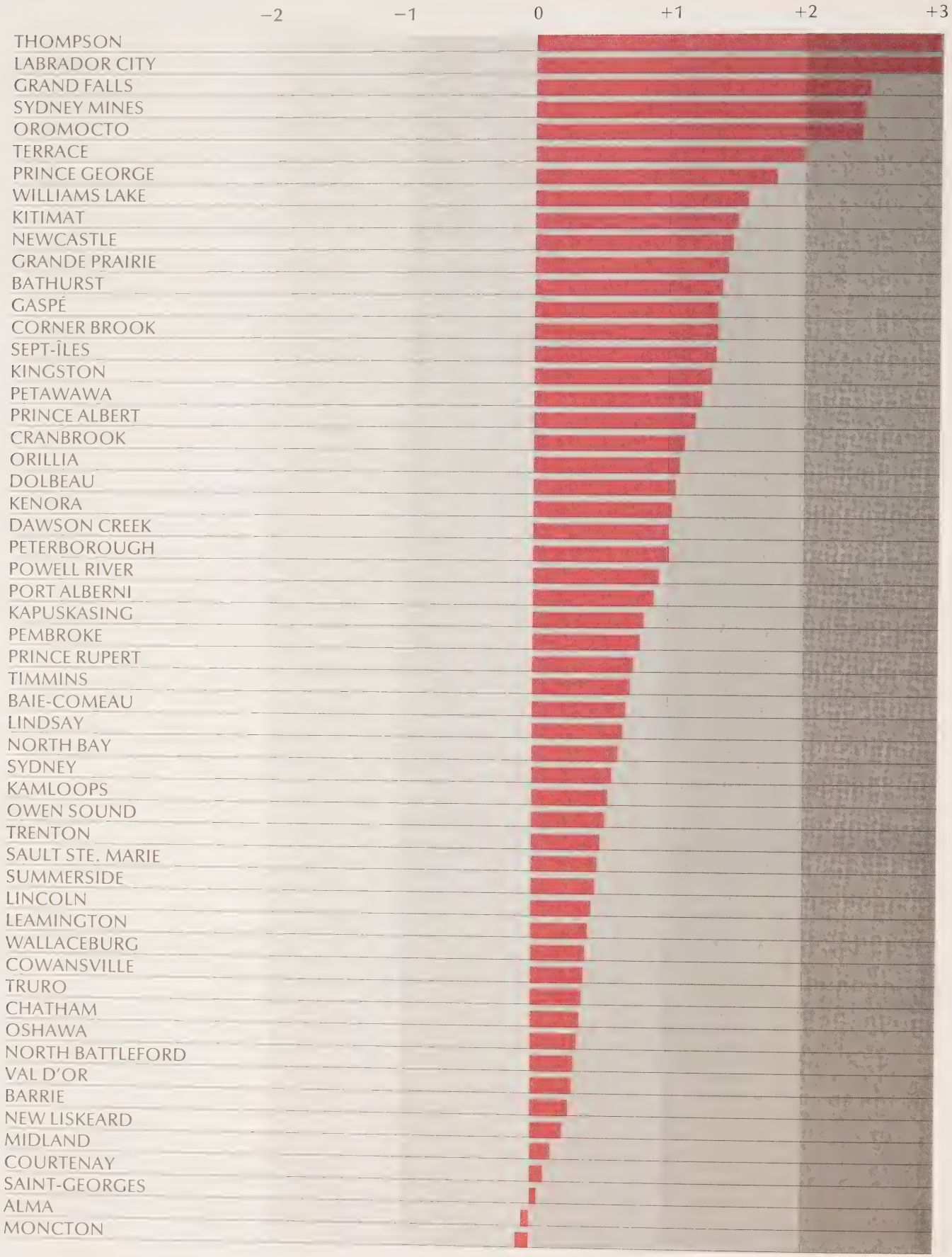
a) Overall aggregate values	Youth dependency ratio		
Mean ($\bar{X}$)	.40		
Standard deviation (S)	.05		
Maximum	.59		
Minimum	.28		
b) By region	$\bar{X}$	S	N
Atlantic	.45	.06	17
Québec	.31	.04	30
Ontario	.39	.03	35
Prairies	.40	.06	13
British Columbia	.42	.06	17

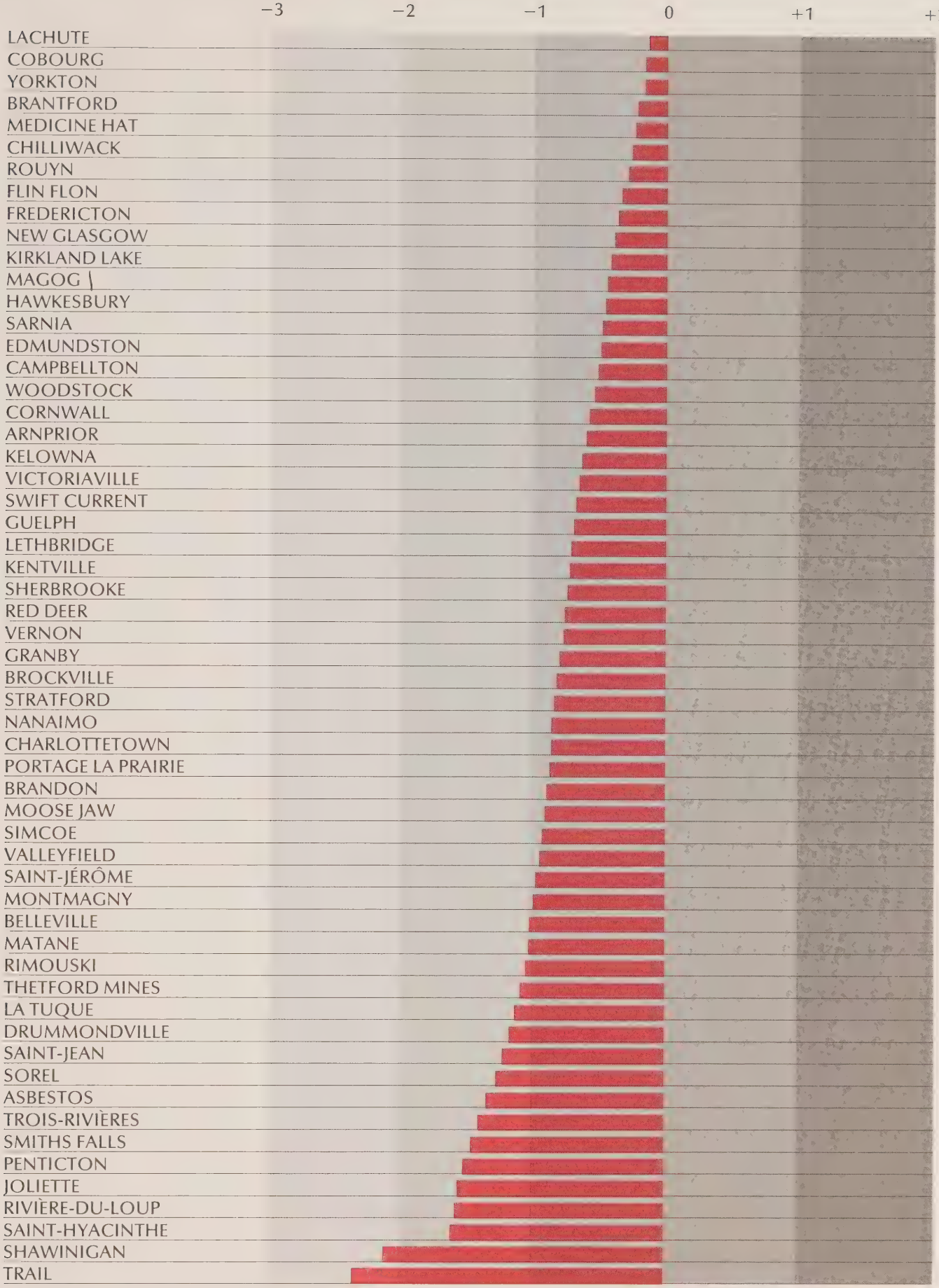
TABLE 3. YOUTH DEPENDENCY RATIO (1976)

ATLANTIC REGION	Bathurst	.46	Moncton*	.39
	Campbellton	.38	Newcastle+	.48
	Charlottetown+	.36	New Glasgow+	.38
	Corner Brook	.46	Oromocto	.51
	Edmundston	.38	Summerside	.42
	Fredericton	.38	Sydney*	.43
	Grand Falls	.52	Sydney Mines*	.51
	Kentville	.37	Truro*	.41
	Labrador City	.57		
QUÉBEC REGION	Alma	.40	Rivière-du-Loup	.32
	Asbestos	.33	Rouyn*	.38
	Baie-Comeau*	.43	Saint-Georges+	.40
	Cowansville	.37	Saint-Hyacinthe*	.32
	Dolbeau+	.45	Saint-Jean*	.33
	Drummondville*	.34	Saint-Jérôme*	.35
	Gaspé	.46	Sept-Îles	.46
	Granby*	.36	Shawinigan*	.29
	Joliette*	.32	Sherbrooke*	.37
	Lachute	.39	Sorel*	.33
	La Tuque	.34	Thetford Mines*	.34
	Magog	.38	Trois-Rivières*	.33
	Matane	.35	Val-d'Or	.41
	Montmagny	.35	Valleyfield*	.35
	Rimouski*	.34	Victoriaville*	.37
ONTARIO REGION	Arnprior	.37	New Liskeard	.41
	Barrie*	.41	North Bay*	.43
	Belleville	.35	Orillia	.35
	Brantford*	.38	Oshawa*	.41
	Brockville*	.36	Owen Sound	.37
	Chatham	.41	Pembroke+	.36
	Cobourg+	.39	Petawawa+	.46
	Cornwall	.38	Peterborough*	.35
	Guelph*	.37	Sarnia*	.38
	Hawkesbury	.38	Sault Ste. Marie*	.42
	Kapuskasing	.44	Simcoe	.35
	Kenora	.35	Smiths Falls	.33
	Kingston*	.33	Stratford	.36
	Kirkland Lake	.38	Timmins	.43
	Leamington	.42	Trenton*	.42
	Lincoln	.42	Wallaceburg	.42
	Lindsay	.37	Woodstock	.38
	Midland*	.39		
PRAIRIES REGION	Brandon	.36	Portage la Prairie	.36
	Flin Flon	.38	Prince Albert	.46
	Grande Prairie	.47	Red Deer	.37
	Lethbridge	.37	Swift Current	.37
	Medicine Hat*	.38	Thompson	.58
	Moose Jaw*	.36	Yorkton	.39
	North Battleford	.41		
BRITISH COLUMBIA REGION	Chilliwack	.38	Port Alberni*	.44
	Courtenay+	.40	Powell River	.44
	Cranbrook	.45	Prince George	.49
	Dawson Creek	.44	Prince Rupert	.43
	Kamloops	.43	Terrace	.49
	Kelowna	.37	Trail	.28
	Kitimat	.48	Vernon	.37
	Nanaimo	.36	Williams Lake	.48
	Penticton	.32		

NOTES: 1976 boundaries are used for all urban areas.
*Census Agglomeration (1976 boundaries).
+Adjoining municipalities with an urban population of 5000 or more (1976 boundaries).
In all the tables based on the 1971 Census of Canada, data are reported for Haileybury C.A. However, in 1976, this data was no longer available as Haileybury ceased to be listed as a C.A. Data is given instead for the town of New Liskeard which is the largest agglomeration in the area.
SOURCE: Calculations based on Statistics Canada, *1976 Census of Canada, Population: Demographic Characteristics*, Cat. 92-823 (Ottawa: 1978).

GRAPH 2. YOUTH DEPENDENCY RATIO (1976)
(Z Scores)




−3
−2
−1
0
+1
+2
LACHUTE
COBOURG
YORKTON
BRANTFORD
MEDICINE HAT
CHILLIWACK
ROUYN
FLIN FLON
FREDERICTON
NEW GLASGOW
KIRKLAND LAKE
MAGOG
HAWKESBURY
SARNIA
EDMUNDSTON
CAMPBELLTON
WOODSTOCK
CORNWALL
ARNPRIOR
KELOWNA
VICTORIAVILLE
SWIFT CURRENT
GUELPH
LETHBRIDGE
KENTVILLE
SHERBROOKE
RED DEER
VERNON
GRANBY
BROCKVILLE
STRATFORD
NANAIMO
CHARLOTTETOWN
PORTAGE LA PRAIRIE
BRANDON
MOOSE JAW
SIMCOE
VALLEYFIELD
SAINT-JÉRÔME
MONTMAGNY
BELLEVILLE
MATANE
RIMOUSKI
THETFORD MINES
LA TUQUE
DRUMMONDVILLE
SAINT-JEAN
SOREL
ASBESTOS
TROIS-RIVIÈRES
SMITHS FALLS
PENTICTON
JOLIETTE
RIVIÈRE-DU-LOUP
SAINT-HYACINTHE
SHAWINIGAN
TRAIL

OLD AGE DEPENDENCY RATIO (1976)

ASPECT MEASURED

The old-age dependency ratio measures the size of the "mostly retired" population as a proportion of the "mostly-working-age" population. The ratio is the number of elderly persons aged 65 and over in each community (who are generally not in the labour force) divided by the number of persons aged 15 to 64 (who potentially can be members of the labour force).

As a result of earlier retirement and longer life spans, older, retired people are becoming an increasingly significant segment of a community's population, one which has needs and demands that are somewhat different from those of other age groups. With a higher proportion of single-person households, lower cash income, less education, lower mobility and more leisure time, the older population needs support and services of a different kind and degree than the younger population. Although, to a large extent, individual families shoulder the responsibility for the dependency of the aged, the elderly also rely heavily on the social, recreational and health services provided by the community as a whole. Hence, cities which have a higher old-age dependency ratio are likely to experience heightened demand for medical care, leisure programs, nursing homes, small modestly-priced dwelling units and programs to assist with household tasks. Needless to say, some community facilities such as day-care centres, sports fields and elementary schools would be less in demand in cities with an aging population.

URBAN PATTERN

On a national basis, the old-age dependency ratio for the medium-sized cities varies markedly from a low of .01 in the resource community of Labrador City to a high of .30 in Canada's southern-most city, Leamington. On average, the older population is proportionately larger in Prairie and Ontario communities, considerably smaller in Maritime and B.C. cities, and smaller still in Québec centres. In addition, when the dependency ratios for individual cities are normalized and then ranked, the 25 top-ranking places include 11 from Ontario and 6 from the Prairies, but none from Québec.

Regional variation in the size of the elderly age group corresponds, to a considerable degree, with areal differences in mortality rates. Since 1926, when figures were first recorded for all the provinces, the age-adjusted death rate has almost invariably been lowest in the three Prairie provinces and highest in Québec.[7] However, differences in old-age dependency between individual cities cannot be fully explained by regional variations in the death rate. To understand the spatial pattern, a more complete range of factors must be taken into account.

[7]Statistics Canada, Health Division, *Vital Statistics, Volume III, Deaths*, Cat. 34-206, (Ottawa: 1976) Annual.

Some factors that apparently tend to convert a community into a retirement centre are small size, a warm climate and a lack of noxious industry. Such features are present to a large degree in the two centres with the proportionately largest elderly population (e.g., Leamington and Penticton) and undoubtedly help to create a pleasant environment that attracts the retired. Also, many cities that have an older population are situated in the midst of the rich agricultural areas of southern Ontario and the Prairies. Thus, they serve as a retirement centre for farm people from the surrounding rural area. Agricultural service centres in this category include Moose Jaw, North Battleford, Yorkton and Swift Current in Saskatchewan as well as Lindsay, Cobourg, Simcoe and Stratford in southern Ontario.

At the other extreme, cities with few retired people share a number of common characteristics. All are located in the nation's resource hinterland; most are based on primary processing; and many were only recently established or have recently undergone rapid economic expansion. Among the cities with low old-age dependency ratios are military bases (e.g., Oromocto, Petawawa), mining towns (e.g., Thompson, Labrador City) and other resource centres (e.g., Prince George, Kitimat, Williams Lake, Sept-Îles and Shawinigan). Isolated locations, an inhospitable climate and noxious, polluting industries are all possible reasons why retired people tend to leave or avoid these and other northern resource communities in favour of the more ambient environment found in southerly centres.

a) Overall aggregate values	Old age dependency ratio		
Mean ($\bar{X}$)	.14		
Standard deviation (S)	.05		
Maximum	.30		
Minimum	.01		
b) By region	$\bar{X}$	S	N
Atlantic	.14	.06	17
Québec	.11	.03	30
Ontario	.16	.05	35
Prairies	.16	.06	13
British Columbia	.12	.07	17

OTHER MEASURES

No single summary measure of age structures can completely reflect the subtleties of city differences in the proportion of the population in each age cohort. Perhaps the most useful, disaggregated form of analysis is the age-sex pyramid which permits a complete review of the major demographic events in a town's history. A bulge in the pyramid, for example, may indicate an uncharacteristic short-term rise in the birth rate (the "baby boom") at some time in the past, while an indentation at a particular age cohort may signify a dramatic lowering of the birth rate during an earlier period (the postponement of marriages and family development during the depression and the war years). Nevertheless, the measure is not suitable for comparative studies involving a sizeable number of communities due to the large volume of information that has to be manipulated and digested.

Also available are a full slate of aggregative measures which attempt to capture differences in age structure through the computation of ratios between assorted age groups. A brief review of the literature will turn up maturity ratios, dependency ratios, the life cycle index, the median age and other sundry measures.[8] Each has been devised for a slightly different purpose.

A final consideration are the diverse measures associated with age structure, generally through some type of cause and effect relationship. The most fundamental correlates of a city's age structure are the components of population change, the fertility rate and the age-specific mortality rate. In like manner, rates of migration, and thus of population growth, may be partially reflected in a community's age composition due to the age selectivity of the migration process in favour of the young adult population (20-34) which is also the most fertile age group. Another basic measure, the sex ratio, is also related to age structure because of the preponderance of males at birth and the longer female life span.

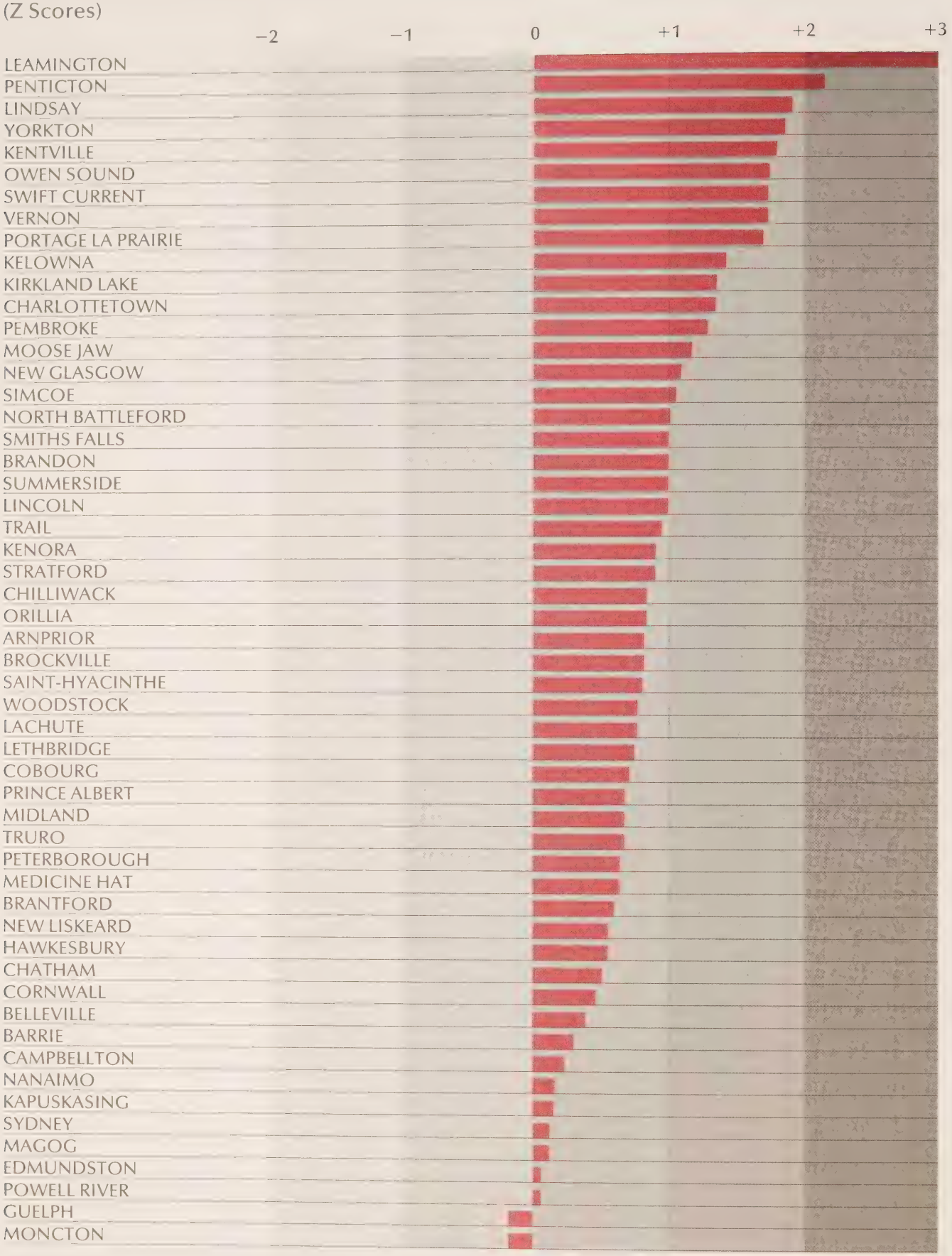
[8]The maturity ratio is (Males aged 35-64/Males aged 20-64) 100.
The life cycle index is (Persons aged 45 and over/Persons aged 0-14).
Fifty percent of the population lies below the median age.
An example of the use of the maturity ratio is found in: Stone, Leroy O. , *Urban Development in Canada* (Ottawa: Dominion Bureau of Statistics, Census Division, 1967). The life-cycle index is employed in D. Michael Ray, *Canadian Urban Trends, National Perspective, Volume One*. (Toronto and Ottawa: Copp Clark and the Ministry of State for Urban Affairs, 1977).

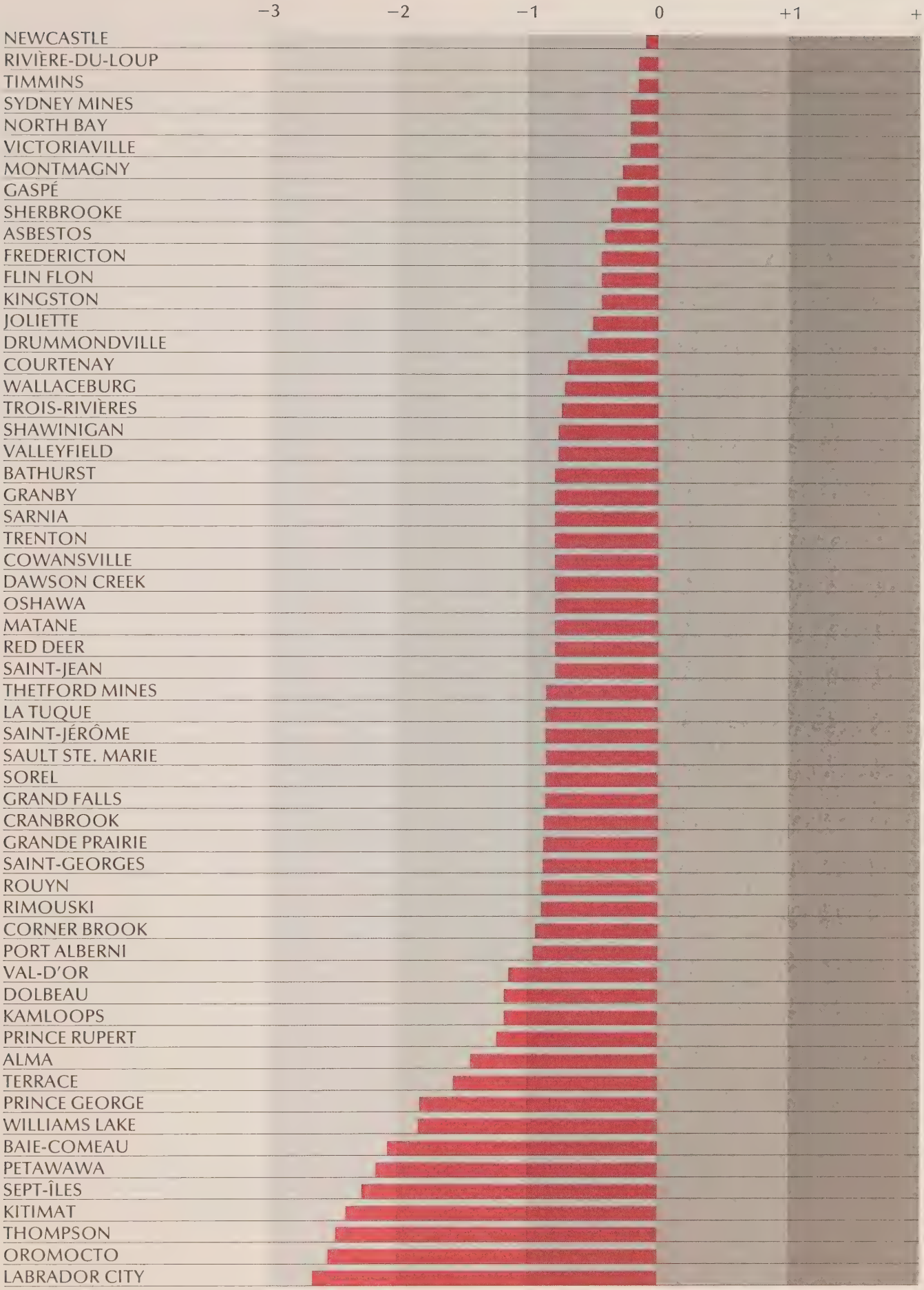
TABLE 4. OLD AGE DEPENDENCY RATIO (1976)

ATLANTIC REGION	Bathurst	.11	Moncton*	.13
	Campbellton	.15	Newcastle+	.13
	Charlottetown+	.22	New Glasgow+	.21
	Corner Brook	.09	Oromocto	.01
	Edmundston	.14	Summerside	.19
	Fredericton	.12	Sydney*	.15
	Grand Falls	.10	Sydney Mines*	.13
	Kentville	.23	Truro*	.17
	Labrador City	.01		
QUÉBEC REGION	Alma	.06	Rivière-du-Loup	.13
	Asbestos	.10	Rouyn*	.10
	Baie-Comeau*	.03	Saint-Georges+	.10
	Cowansville	.11	Saint-Hyacinthe*	.18
	Dolbeau+	.08	Saint-Jean*	.11
	Drummondville*	.12	Saint-Jérôme*	.10
	Gaspé	.13	Sept-Îles	.03
	Granby*	.11	Shawinigan*	.12
	Joliette*	.12	Sherbrooke*	.13
	Lachute	.18	Sorel*	.10
	La Tuque	.10	Thetford Mines*	.11
	Magog	.14	Trois-Rivières*	.12
	Matane	.11	Val-d'Or	.08
	Montmagny	.13	Valleyfield*	.11
	Rimouski*	.10	Victoriaville*	.13
ONTARIO REGION	Arnprior	.18	New Liskeard	.16
	Barrie*	.15	North Bay*	.11
	Belleville	.16	Orillia	.18
	Brantford*	.17	Oshawa*	.11
	Brockville*	.18	Owen Sound	.23
	Chatham	.16	Pembroke+	.22
	Cobourg+	.17	Petawawa+	.03
	Cornwall	.16	Peterborough*	.17
	Guelph*	.13	Sarnia*	.11
	Hawkesbury	.11	Sault Ste. Marie*	.10
	Kapuskasing	.10	Simcoe	.22
	Kenora	.19	Smiths Falls	.20
	Kingston*	.12	Stratford	.19
	Kirkland Lake	.22	Timmins	.13
	Leamington	.30	Trenton*	.11
	Lincoln	.19	Wallaceburg	.16
	Lindsay	.24	Woodstock	.18
	Midland*	.17		
PRAIRIES REGION	Brandon	.20	Portage la Prairie	.22
	Flin Flon	.12	Prince Albert	.17
	Grande Prairie	.10	Red Deer	.11
	Lethbridge	.18	Swift Current	.22
	Medicine Hat*	.17	Thompson	.02
	Moose Jaw*	.21	Yorkton	.23
	North Battleford	.20		
BRITISH COLUMBIA REGION	Chilliwack	.18	Port Alberni*	.08
	Courtenay+	.12	Powell River	.14
	Cranbrook	.10	Prince George	.04
	Dawson Creek	.11	Prince Rupert	.07
	Kamloops	.07	Terrace	.06
	Kelowna	.22	Trail	.19
	Kitimat	.02	Vernon	.22
	Nanaimo	.15	Williams Lake	.04
	Penticton	.26		

NOTES: 1976 boundaries are used for all urban areas.
*Census Agglomeration (1976 boundaries).
+Adjoining municipalities with an urban population of 5000 or more (1976 boundaries).
In all the tables based on the 1971 Census of Canada, data are reported for Haileybury C.A. However, in 1976, this data was no longer available as Haileybury ceased to be listed as a C.A. Data is given instead for the town of New Liskeard which is the largest agglomeration in the area.
SOURCE: Calculations based on Statistics Canada, *1976 Census of Canada, Population: Demographic Characteristics*, Cat. 92-823 (Ottawa: 1978).

GRAPH 3. OLD AGE DEPENDENCY RATIO (1976)
(Z Scores)




−3
−2
−1
0
+1
+2
NEWCASTLE
RIVIÈRE-DU-LOUP
TIMMINS
SYDNEY MINES
NORTH BAY
VICTORIAVILLE
MONTMAGNY
GASPÉ
SHERBROOKE
ASBESTOS
FREDERICTON
FLIN FLON
KINGSTON
JOLIETTE
DRUMMONDVILLE
COURTENAY
WALLACEBURG
TROIS-RIVIÈRES
SHAWINIGAN
VALLEYFIELD
BATHURST
GRANBY
SARNIA
TRENTON
COWANSVILLE
DAWSON CREEK
OSHAWA
MATANE
RED DEER
SAINT-JEAN
THETFORD MINES
LA TUQUE
SAINT-JÉRÔME
SAULT STE. MARIE
SOREL
GRAND FALLS
CRANBROOK
GRANDE PRAIRIE
SAINT-GEORGES
ROUYN
RIMOUSKI
CORNER BROOK
PORT ALBERNI
VAL-D'OR
DOLBEAU
KAMLOOPS
PRINCE RUPERT
ALMA
TERRACE
PRINCE GEORGE
WILLIAMS LAKE
BAIE-COMEAU
PETAWAWA
SEPT-ÎLES
KITIMAT
THOMPSON
OROMOCTO
LABRADOR CITY

Changes in the quality of life experienced in a city cannot be understood solely in the context of its existing structural characteristics. The linkages between one city and another, the level of interaction between urban centres in terms of migrants, commodity flows, telephone communications, etc., must be given due heed when the quality of life profiles are depicted for communities. The patterns of inter-urban migration are particularly important.

Canadians are a mobile people. In recent decades, the volume of internal migration has not only increased but has focussed on a limited number of destinations: only Ontario, Alberta and British Columbia have been consistently favoured with a net inflow of internal as well as foreign migrants, a pattern which has led to rapid growth in these provinces.[9] Movement between urban areas, rather than the traditional flow from farm to city, has predominated in recent years. Historically, migration has profoundly influenced the demographic composition of cities, creating concentrations of young adults in receiving centres, broadening the ethnic mix, strengthening the labour force and diversifying the mix of occupational skills, while having the opposite consequences for centres of net outmovement.

Migration has tended to be selective of certain segments of the population according to sex, age, education, income and employment status. Typically, migrants are younger than the population as a whole; males predominate slightly among long distance (inter-provincial) movers; and, conversely, females predominate for short-distance moves, especially to large urban centres. Those who migrate, especially those moving long distances, tend to be employed in professional and technical occupations and have higher education levels than those who stay.

Determining why people migrate is a problem fraught with difficulties. Usually, a substantial proportion of migration is attributed to "economic" motives.[10] Information flows and images held regarding employment, wages and living conditions in a particular place also influence the decision to migrate and the destination selected. The extent to which non-pecuniary factors such as services, amenities and social opportunities or, conversely, noise, pollution and congestion weigh in the decision of prospective migrants is a matter for more investigation.

Migration, as an agent of change, contributes significantly to the population growth or decline of communities and causes substantial shifts in the demographic composition of urban areas. If flows of arriving and departing migrants differ systematically from each other in sex, age, ethnicity or occupational status, considerable alteration in the demographic structure of a place can occur. Each of the major change situations arising from migration — net population gain, net population loss and high net population turnover — has implications for the quality of life experienced in a community. A centre which has received a net inflow of migrants may be further stimulated economically by the presence of a younger, educated labour force and an enlarged consumer market; but it may also suffer from congestion and excessive demands placed on local services and facilities. However, communities which have experienced population losses through out-migration are often left with an older, less skilled and, hence, less competitive labour force that tends to reinforce the social and economic difficulties confronting the centre. Yet, even though the population size remains relatively unchanged, residents of places that undergo high population turnover may not only derive benefit from the new people, skills and ideas introduced, but also suffer from the disruption of established social ties and the loss of key members of their social networks.

An indicator of population turnover, the gross migration ratio, is presented.

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[9]The 1971-75 period saw a departure from past trends in internal migration. More people moved into the Maritime provinces than moved out, while departures slightly exceeded arrivals in the province of Ontario.

[10]Ira S. Lowry, *Migration and Metropolitan Growth, Two Analytical Models* (San Francisco: Chandler, 1966); Leroy O. Stone, *Migration in Canada: Regional Aspects*, 1961 Census Monograph (Ottawa: Dominion Bureau of Statistics, 1969).

POPULATION TURNOVER: GROSS MIGRATION RATIO (1966-71)

ASPECT MEASURED

The gross migration ratio for a community refers to the sum of in-migrants and out-migrants expressed as a proportion of the 1971 population total. For a given municipality, in-migrants are composed of the 1971 (1 June) residents who resided in another municipality on 1 June 1966, and out-migrants are those who resided there on 1 June 1966 but were living in another municipality on 1 June 1971.

The gross migration ratio is indicative of the turnover of population experienced by an urban centre during the five-year period, 1966-71. In general terms, it measures overall population stability in a city and reflects the extent to which social relationships are made or broken as a result of moving. It should be noted that lack of growth is not necessarily synonymous with population stability in an urban centre. It is conceivable, for example, that a city in which population size has remained unchanged over the five-year period has undergone a greater level of population turnover than one which has grown substantially in size.

A high turnover of residents carries both benefits and drawbacks for the immediate neighbourhood and the wider community. On the one hand, an influx of newcomers can mean new social ties, new community leaders and renewed vigour in community organizations and activities. On the other hand, a continual flow of transients through a community may result in a "construction camp mentality" replete with a sense of impermanency, a lack of community identity and law involvement in community institutions and programs.

It is also possible that a population may be too stable. Undoubtedly, numerous socio-psychological benefits accrue to long-term residents in a community including a sense of permanency, security in long-term friendships, an extensive network of contacts and an intricate knowledge of the local area and how its institutions work. Long-term citizens also provide continuity of leadership and support to community enterprises, services and activities. But a city's industries, businesses, services and voluntary associations may also suffer from a "hardening of the arteries" if there is not a sufficient influx of new residents with innovative ideas, approaches and initiatives. The costs incurred from excessive population stability may include a rigid social hierarchy, lacklustre leadership, undue resistance to change, obsolescent technology and outmoded organizational structures.

Although precise upper and lower limits cannot be specified, it would appear that most organizations, activities and neighbourhoods in a city would benefit from a moderate level of population turnover. A moderate turnover may help to avoid the opposing problems of stagnation induced by low levels of migration as well as social disruption caused by excessive migration, while tapping the benefits of both continuity and innovation.

DIFFICULTIES OF INTERPRETATION

Although the data provide useful aggregate measures of turnover, there are inherent shortcomings in the available census statistics on migration. Most importantly, measurement is limited to five-year migration, that is, the differences in place of residence for a particular individual as 1 June 1966 and 1 June 1971. As a consequence, multiple moves and return migration that occurred between these two dates cannot be detected.[11]

Another problem that besets migration analysts is that the characteristics of the migrants were recorded at the date when the census was taken (i.e., 1 June 1971) rather than at the time of the move. Thus, few clues may be gathered as to the "selection process" operating when the move actually transpired. For example, a change in occupational or marital status may have "motivated" a person to move, but the census would only report his present occupation, his existing marital status and that he has moved once or more during the past five years. Consequently, changes in social and economic characteristics as a "cause" of migration cannot be directly assessed. The results of the cross-tabulation of migration differentials can be considered only as approximations.

The delineation of municipal boundaries also poses problems for the measurement of migration. In theory, migration implies the transplantation of a person's roots from one distinct community to another, but, in practice, the concept is partly lost since persons moving a substantial distance within a large municipal unit are missed, while others who just shift "across the street", but cross a municipal boundary, are considered as migrants. A related measurement difficulty is the delimitation of consistent municipal boundaries for the five-year span in the face of the multitude of adjustments caused by amalgamations, annexations and the initiation of regional governments. Generally, municipal boundaries as of 1 June 1966 were used to measure migration, but for a few census agglomerations, most notably in British Columbia, the 1966 boundary delineations are crude estimates only.[12]

[11]The "hyper-mobile", those who moved several times during the five-year period, are identified in the 1971 Census but the origins and destinations of the intervening moves are not recorded.

[12]In cases where census agglomerations (CAs) encompass only part of a census subdivision, the entire subdivision was allocated to the area if its population was predominantly located within the CA. Otherwise, the subdivision was excluded. The reconstruction of CA boundaries was completed by Statistics Canada using the algorithm MA5YAGO. This adjustment most commonly occurred in B.C. where the census subdivisions are very large. Places most affected were Kamloops, Kelowna, Nanaimo, Port Alberni,Prince George, Courtenay, and Terrace.

URBAN PATTERN

With few exceptions, population turnover increased progressively from east to west across the nation. On average, the gross migration ratios were low in Maritime and Québec communities, moderate in Ontario centres and high in Prairie and B.C. cities. Within the regions, the greatest variation in turnover rates between cities was found in the Maritimes, the smallest in Québec.

Not surprisingly, the highest rates of population turnover were recorded for military towns (e.g., Oromocto, Petawawa, Trenton and Summerside) and frontier resource communities (e.g., Labrador City, Thompson, Grande Prairie, Dawson Creek and Kitimat). Other centres with a footloose population included the university towns (e.g., Fredericton, Kingston) and the retirement meccas (e.g., Vernon, Penticton). Less transitory than average were the residents of old mining communities (e.g., Asbestos, Thetford Mines), old paper-mill towns (e.g., Edmundston, La Tuque, Shawinigan, Cornwall and Hawkesbury) and long established manufacturing centres, especially those in proximity to Montréal (e.g., Granby, Drummondville and Valleyfield, and also Brantford). Generally, the citizens least likely to move resided in rather isolated centres that serve the rural regions of Québec (e.g., Gaspé, Magog and Montmagny). On the whole, cities situated in the largely francophone regions of Québec recorded the highest degree of population stability.

a) Overall aggregate values	Gross migration ratio		
Mean ($\bar{X}$)	.42		
Standard deviation (S)	.15		
Maximum	.90		
Minimum	.20		
b) By region	$\bar{X}$	S	N
Atlantic	.40	.22	15
Québec	.32	.07	30
Ontario	.42	.13	35
Prairies	.52	.10	13
British Columbia	.53	.11	17

OTHER MEASURES

There are several aggregative measures which yield information closely related to the gross migration ratio. Opposite in form, but similar in intent, are indices of stability, such as percentage population that did not move (1966-71), and length of occupancy measures, such as percentage households residing in the same dwelling for more than ten years.

Possibly the measure most commonly used to summarize place-to-place migration flows is net migration: the number of in-migrants minus the number of out-migrants. The "balance sheet" of incoming and outgoing migrants, the net migration ratio, is a fairly reliable indicator of the economic health of an urban centre. Economically robust communities, experiencing an upswing in industrial production, job opportunities and income levels, are likely to have positive net migration ratios. Conversely, negative net migration ratios are characteristic of economically depressed cities plagued by declining production, plant closures, reduced employment and low income levels.

But, the net migration measure must be interpreted with caution since it merely represents the size difference between population flows in opposite directions. Thus, it is conceivable that a "zero" net migration could obscure high, but evenly balanced, flows of arriving and departing migrants, flows that could cause a substantial change in the demographic structure of a community in terms of age, educational and occupational characteristics if they differed systematically from one another.

For more detailed analyses, two principal types of approaches may be taken: migration streams and migration differentials.[13] Studies of migration streams focus on the volume and direction of place-to-place movement.[14] The study of migration differentials focusses on the differences between movers and stayers according to age, sex, marital status, educational level, occupational type and income.

[13]Patterns of migration streams and migration differentials in Canada for the 1966-71 period are overviewed in Leroy O. Stone, and Susan Fletcher, *Migration in Canada* (Ottawa: Statistics Canada, 1971 Census of Canada, Profile Studies, Cat. 99-705, 1977).

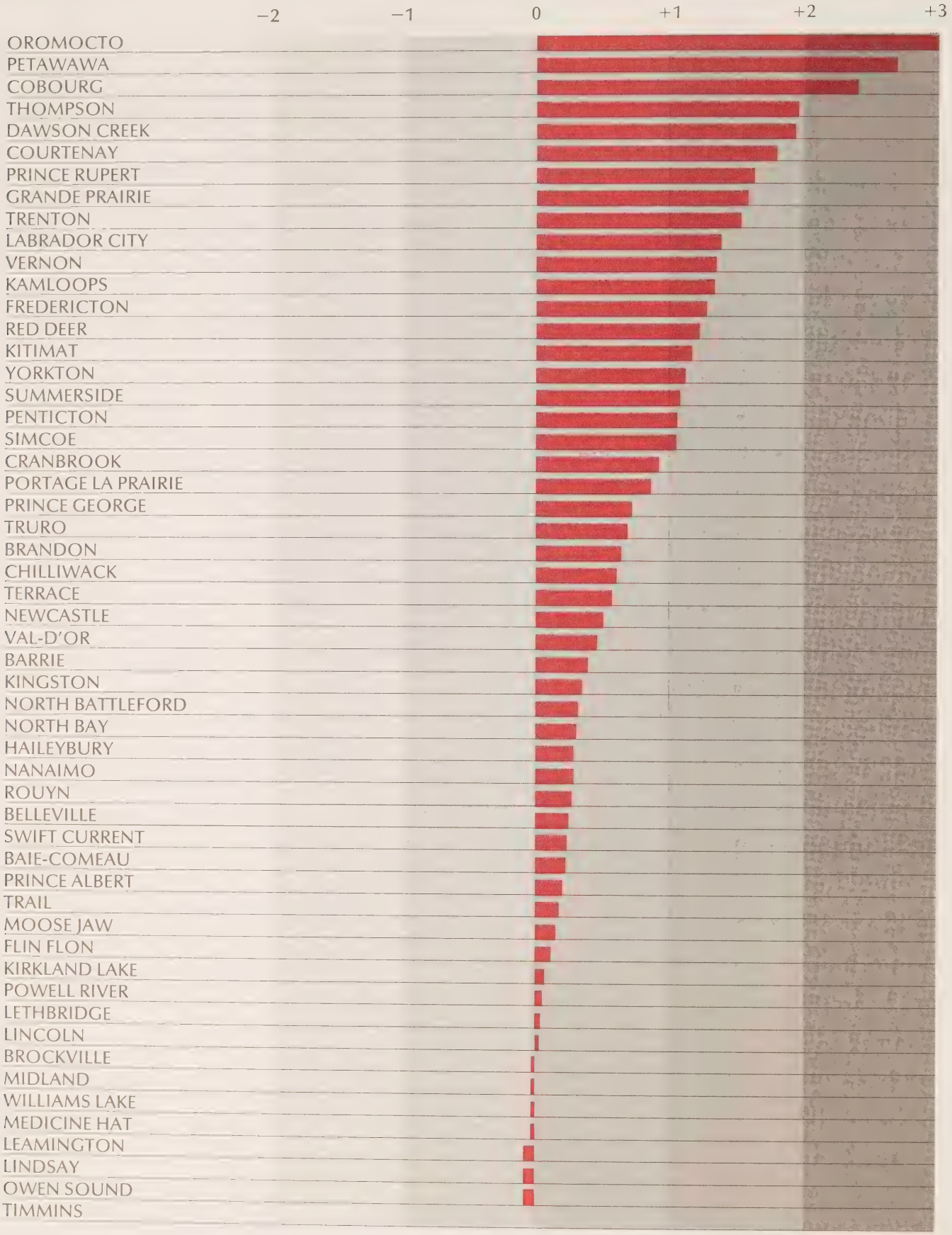
[14]More comprehensive investigations of migration streams and migration differentials in Canada, primarily for the 1956-61 period, are found in: M.V. George, *Internal Migration in Canada: Demographic Analyses*, 1961 Census Monograph (Ottawa: Dominion Bureau of Statistics, 1970); Manpower and Immigration in collaboration with MSUA, *Internal Migration and Immigrant Settlement* (Ottawa: Information Canada, 1975); Leroy O. Stone, *Migration in Canada: Regional Aspects*, 1961 Census Monograph (Ottawa: Dominion Bureau of Statistics, 1969).

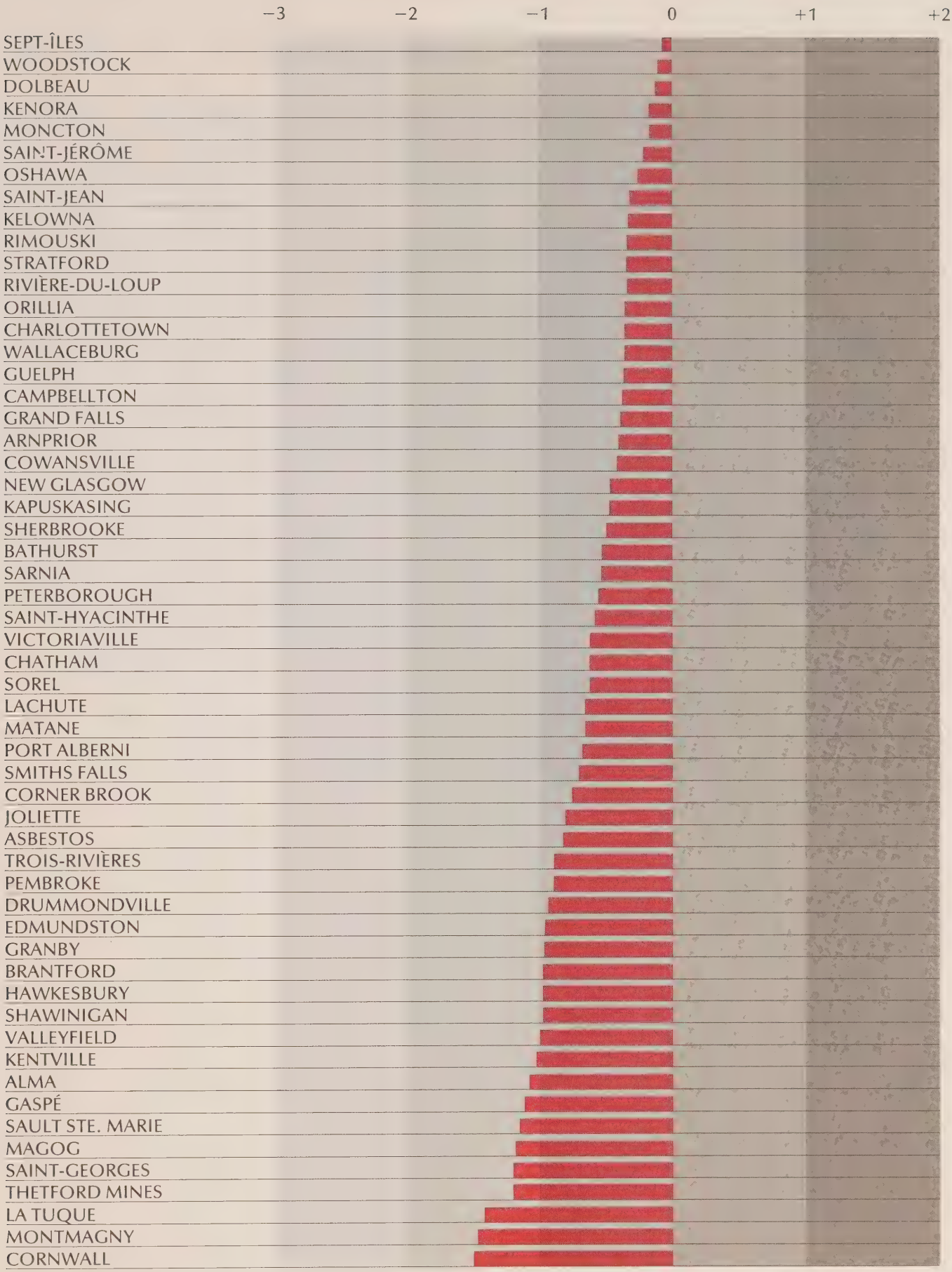
TABLE 5. POPULATION TURNOVER: GROSS MIGRATION RATIO (1966-71)

ATLANTIC REGION	Bathurst	.34	Moncton*	.39
	Campbellton*	.36	Newcastle*	.49
	Charlottetown*	.36	New Glasgow*	.34
	Corner Brook	.31	Oromocto	.90
	Edmundston	.29	Summerside*	.79
	Fredericton*	.62	Sydney*	+
	Grand Falls*	.36	Sydney Mines*	+
	Kentville*	.26	Truro*	.51
	Labrador City*	.64		
QUÉBEC REGION	Alma	.25	Rivière-du-Loup	.36
	Asbestos*	.31	Rouyn*	.47
	Baie-Comeau*	.47	Saint-Georges*	.23
	Cowansville	.35	Saint-Hyacinthe*	.34
	Dolbeau*	.39	Saint-Jean*	.37
	Drummondville*	.29	Saint-Jérôme*	.38
	Gaspé	.24	Sept-Îles	.40
	Granby*	.29	Shawinigan*	.28
	Joliette*	.31	Sherbrooke*	.34
	Lachute*	.33	Sorel*	.33
	La Tuque	.22	Thetford Mines*	.23
	Magog*	.23	Trois-Rivières*	.30
	Matane	.33	Val-d'Or*	.49
	Montmagny	.22	Valleyfield*	.27
	Rimouski*	.37	Victoriaville*	.33
ONTARIO REGION	Arnprior*	.35	Midland*	.41
	Barrie*	.49	North Bay	.48
	Belleville	.47	Orillia	.36
	Brantford*	.29	Oshawa*	.38
	Brockville	.42	Owen Sound	.41
	Chatham	.33	Pembroke*	.30
	Cobourg*	.80	Petawawa*	.84
	Cornwall	.20	Peterborough*	.34
	Guelph*	.36	Sarnia*	.34
	Haileybury*	.48	Sault Ste. Marie*	.23
	Hawkesbury*	.28	Simcoe	.58
	Kapuskasing	.34	Smiths Falls*	.32
	Kenora*	.39	Stratford	.37
	Kingston*	.49	Timmins*	.40
	Kirkland Lake	.44	Trenton*	.67
	Leamington	.41	Wallaceburg	.36
	Lincoln	.42	Woodstock	.40
	Lindsay	.41		
PRAIRIES REGION	Brandon	.50	Portage la Prairie	.55
	Flin Flon*	.45	Prince Albert	.46
	Grande Prairie	.68	Red Deer	.60
	Lethbridge	.43	Swift Current	.47
	Medicine Hat*	.41	Thompson	.71
	Moose Jaw	.45	Yorkton	.60
	North Battleford*	.48		
BRITISH COLUMBIA REGION	Chilliwack*	.50	Port Alberni*	.33
	Courtenay*	.70	Powell River	.43
	Cranbrook	.55	Prince George*	.53
	Dawson Creek	.71	Prince Rupert*	.68
	Kamloops*	.63	Terrace*	.50
	Kelowna*	.37	Trail*	.46
	Kitimat	.60	Vernon	.63
	Nanaimo*	.48	Williams Lake*	.41
	Penticton	.58		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Calculations based on Statistics Canada, *1971 Census of Canada*, unpublished tabulation.

GRAPH 4. POPULATION TURNOVER: GROSS MIGRATION RATIO (1966-71)
(Z Scores)




−3
−2
−1
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+1
+2
SEPT-ÎLES
WOODSTOCK
DOLBEAU
KENORA
MONCTON
SAINT-JÉRÔME
OSHAWA
SAINT-JEAN
KELOWNA
RIMOUSKI
STRATFORD
RIVIÈRE-DU-LOUP
ORILLIA
CHARLOTTETOWN
WALLACEBURG
GUELPH
CAMPBELLTON
GRAND FALLS
ARNPRIOR
COWANSVILLE
NEW GLASGOW
KAPUSKASING
SHERBROOKE
BATHURST
SARNIA
PETERBOROUGH
SAINT-HYACINTHE
VICTORIAVILLE
CHATHAM
SOREL
LACHUTE
MATANE
PORT ALBERNI
SMITHS FALLS
CORNER BROOK
JOLIETTE
ASBESTOS
TROIS-RIVIÈRES
PEMBROKE
DRUMMONDVILLE
EDMUNDSTON
GRANBY
BRANTFORD
HAWKESBURY
SHAWINIGAN
VALLEYFIELD
KENTVILLE
ALMA
GASPÉ
SAULT STE. MARIE
MAGOG
SAINT-GEORGES
THETFORD MINES
LA TUQUE
MONTMAGNY
CORNWALL

Canada is a country of great ethnic diversity. The two "official" founding groups and the multiplicity of other ethnic groups which have migrated to Canada create a society characterized by the image of a "mosaic".[15]

The importance of ethnicity, as it affects social status, occupation, and lifestyle, has been well documented.[16] Similarly, the considerable variety of cultural groups found within Canadian cities has shaped the character of many communities to a significant degree. The presence of minority ethnic groups in significant numbers brings the advantages and disadvantages of cultural diversity. Undoubtedly, Canadian cities are more economically robust, culturally lively and outward-looking due to the influx of peoples of different ethnic origins. The interface of cultures from many continents creates a cosmopolitan atmosphere enriched by the foods, music, arts and lifestyles of other groups. To many, this type of diversity is an important ingredient of an attractive community. At the same time, conflicting values and ways of behaving can create misunderstanding and bad feelings. In a context of competition for jobs, housing, community services and the like, those who are different from the majority are often seen as contributing heavily to increasing demands for community services.

While ethnic diversity may be viewed as either an irritant or an essentially positive feature of community life, it is certainly one factor which can affect the quality of life in cities. At the most fundamental level, the ethnic profile of a community influences its residents as to where they choose to live, what church they attend, who they marry, the occupations they pursue, the contacts they develop and many other aspects of daily living. An Index of Ethnic Diversity is presented.

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[15]John Porter, *The Vertical Mosaic: An Analysis of Social Class and Power in Canada* (Toronto: University of Toronto Press, 1965).

[16]John Porter and Peter Pineo, "Occupational Prestige in Canada", *Canadian Review of Sociology and Anthropology* (February 1967).

ETHNIC DIVERSITY

ASPECT MEASURED

Ethnic origin is the most direct and universal descriptor of people's cultural background. Although language, spoken and written, is the principle vehicle for transmitting cultural heritage from one generation to another, there are many Canadian-born individuals who primarily speak one of the official languages but retain an identity with a foreign cultural group through several generations of Canadian residence. To assert that a third generation, English-speaking Canadian of Scottish ancestry is no different from his English-speaking Italian, Japanese or Dutch counterpart is to overlook the degree to which cultural identity is often preserved.

Although the cultural profile of a community is often painted in terms of the percentage distribution of each ethnic group in turn, the concept of ethnic diversity provides a single summary measure of the ethnic composition of an urban area. The ethnic diversity of a centre reflects, in its cosmopolitan atmosphere, the extent to which cultural hetereogeneity exists and the potential for day-to-day contact between people of different ethnic origins.

The index of ethnic diversity is the sum of the squared proportion of the population in each ethnic group, which is then subtracted from one. The equation is:

$$1 - p_j^2$$

Where p_j equals the proportion of an urban area's population of the $_j$th ethnic group.

A minimum value of zero is recorded when everyone in the urban area derives from the same ethnic background. The maximum is a function of the number of ethnic groups employed in the computation. The twelve ethnic groups used can yield a maximum value of .913, which would imply that each ethnic group accounts for one-twelfth of the city's residents. The groups employed in the development of the index were British, French, German, Italian, Dutch, Polish, Scandinavian, Ukrainian, Russian, Asian, Jewish and the residual "other" category.

DIFFICULTIES OF INTERPRETATION

It is important to realize that there are conceptual problems inherent in the available census statistics on ethnic origin. "Ethnic Group" is determined by response to the census question: "To what ethnic or cultural group did you or your ancestor (on the male side) belong on coming to this continent?". Since this may have been several generations in the past the extent to which people who are recorded as members of an ethnic group and who consider themselves as members of that group may vary. Moreover, some people do not know their ethnic origin because of mixed ancestry or for other reasons. The fact that many native-born Canadians are on solid ground when they maintain that they are of Canadian ethnic origin further clouds the issue. Hence, indices derived from the identification of one's own ethnic origin must be regarded with some circumspection.

The particular index of diversity employed can also give rise to some problem of interpretation since it can yield similar values for a split between the two predominant groups, English and French, or for the presence of the official language groups and a series of minority groups. As an example, urban areas such as Bathurst (.50), Campbellton (.52) and the Haileybury CA (.59), whose population is almost entirely of English and French origins, have a similar index of diversity to cities like Chatham (.55) and Guelph (.53) whose population structure is composed of a predominantly English language group and several moderately sized minority groups. The reader should, therefore, exercise caution when interpreting the data and consult counts and proportional calculations by individual ethnic groups if detailed knowledge of the ethnic profile in a particular city is desired.

URBAN PATTERN

Marked differences in the level of ethnic diversity occur between regions, but variations among communities within regions are less pronounced. Prairie and B.C. centres show a diverse ethnic composition while Maritime and Québec communities are characterized by a culturally homogeneous profile. Generally, cities in Ontario diverge less from the national norm. Nevertheless, communities in the northern and southwestern sections of the province have a more culturally diverse population than centres in eastern Ontario.

The sharpness of the variation in community cultural profiles between regions may be illustrated in several ways. The maximum index values for ethnic diversity among Québec and Maritime cities are less than the national average, while the minimum recorded in Prairie and B.C. centres exceeds the national mean. When the ethnic diversity measure is normalized and the scores are ranked, it is found that 24 cities possess scores of -1.0 or lower, including 2 centres located in Newfoundland and 22 places situated in Québec. Conversely, the 25 communities having normalized scores of +1.0 or more comprised 10 centres from British Columbia, 9 from the Prairies and 7 from Ontario. Places with a polyglot citizenry were most prominent on the Prairies, the region in which four of the five most diverse centres are situated.

The sharp distinction between the culturally homogeneous centres of the East and the culturally heterogeneous communities of the West largely stems from the patterns noted earlier. In addition, migrants have typically gravitated to the more prosperous regions of the nation in search of better jobs.

a) Overall aggregate values	Ethnic diversity index		
Mean ($\bar{X}$)	.42		
Standard deviation (S)	.23		
Maximum	.77		
Minimum	.02		
b) By region	$\bar{X}$	S	N
Atlantic	.32	.13	17
Québec	.15	.10	30
Ontario	.50	.14	35
Prairies	.69	.06	13
British Columbia	.66	.07	17

OTHER MEASURES

No single characteristic can provide a complete picture of the complex ethnic and cultural composition found in Canada's cities. The complexity of the cultural mosaic is reflected in the fact that the decennial censuses of Canada have continued to employ a number of questions to obtain information about the cultural background of Canadians. Other attributes that may be used to create a cultural profile of an urban centre are Birthplace, Language Spoken at Home, Mother Tongue and Religious Affiliation.

Birthplace is seemingly the most straightforward measure of cultural diversity. Percentage Canadian-born measures the proportion of a community's population born in this country and, as such, may reflect the degree to which a community's citizens share a common cultural heritage. At the same time, it measures the percentage of the community's population who are foreign-born, those elements of the population who will exhibit most strongly their original culture and who will still be undergoing adjustment to the Canadian cultural milieu.

The percentage of a community's population who speak neither English nor French in the home is perhaps the most rigorous measure of the degree to which people have retained their original culture within the mainstream of Canadian society. The size of the largest, minority-language groups represents one way of determining if there are ethnic groups of sufficient magnitude to demonstrate a discrete cultural presence in the community. While shared language does not necessarily mean that people possess the same culture, language is the principal means for transmitting cultural elements and is, thus, a most important aspect of cultural presence.

An alternative measure is mother tongue, the first language learned and still understood at the time of the census. However, mother tongue is a less stringent measure of cultural retention than language spoken at home. Undeniably, it reflects a group's linguistic heritage, yet many people whose mother tongue is neither English nor French may, in practice, be totally assimilated into the mainstream of Canadian society.

Another significant cultural measure is religious denomination. Although the decline in church attendance would lead some to discount the importance of religious beliefs, the continuing significance of religious affiliation does reflect an important cultural element to many millions of Canadians. For census purposes, religious denomination refers to the specific religious body, denomination, sect or community reported in response to the question: "What is your religion?". Census figures do not measure church membership or indicate the degree of affiliation with any religious body.

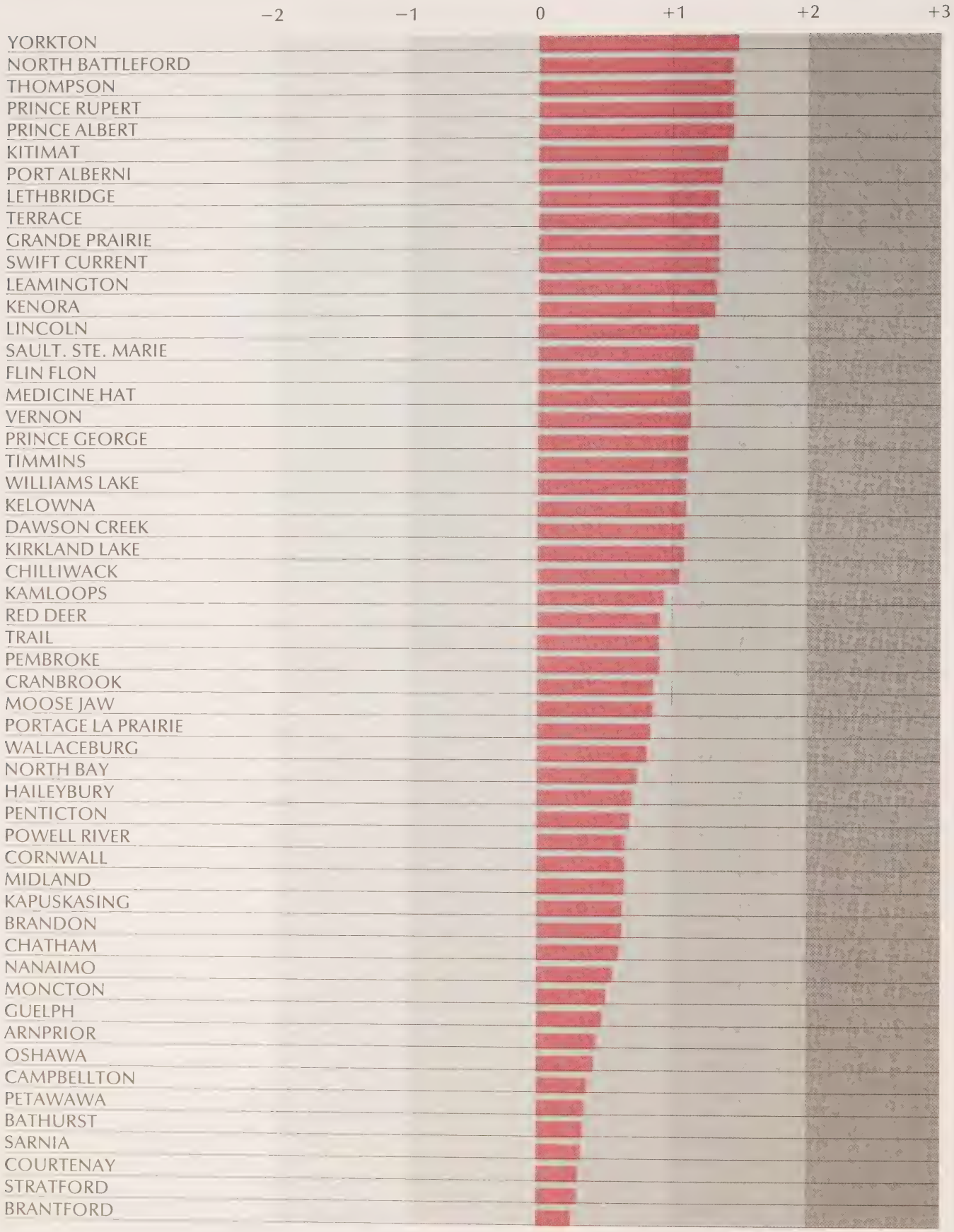
A more concrete manifestation of a group's retention of its original culture is the array of institutions and services provided within an ethnic minority. Such institutions include newspapers, special media programming, religious institutions, voluntary organizations, educational programs, festivals, stores and personal services that cater to the needs of a particular ethnic or language group. Unfortunately, information concerning such institutions and programs is not readily available for the full set of places under review.

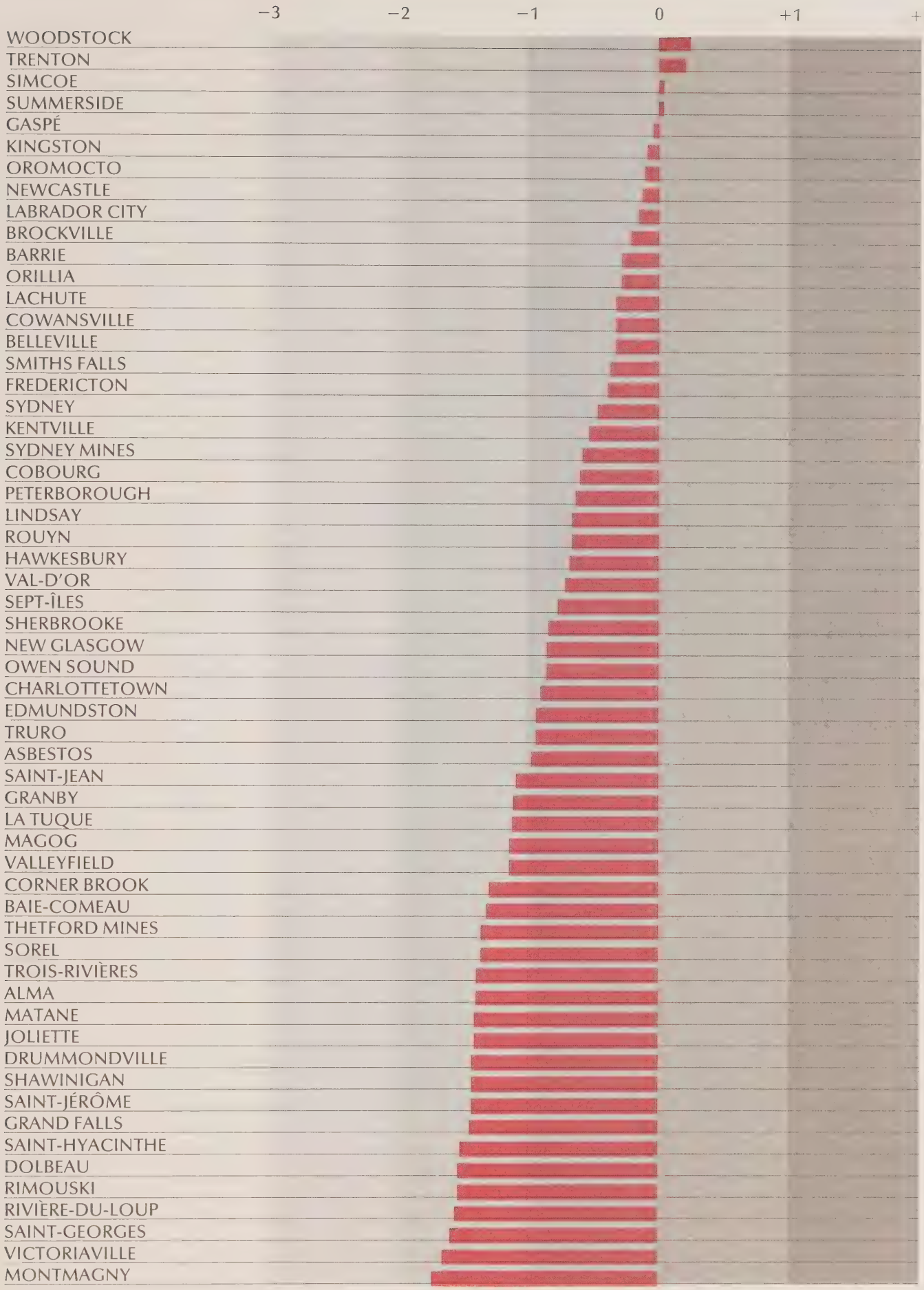
TABLE 6. INDEX OF ETHNIC DIVERSITY (1971)

ATLANTIC REGION	Bathurst	.501	Moncton*	.530
	Campbellton*	.515	Newcastle*	.404
	Charlottetown*	.216	New Glasgow*	.234
	Corner Brook	.130	Oromocto	.407
	Edmundston	.209	Summerside*	.427
	Fredericton*	.327	Sydney*	.315
	Grand Falls*	.084	Sydney Mines*	.290
	Kentville*	.294	Truro*	.206
	Labrador City*	.390		
QUÉBEC REGION	Alma	.096	Rivière-du-Loup	.063
	Asbestos*	.201	Rouyn*	.278
	Baie-Comeau*	.127	Saint-Georges*	.060
	Cowansville	.346	Saint-Hyacinthe*	.064
	Dolbeau*	.063	Saint-Jean*	.179
	Drummondville*	.092	Saint-Jérôme*	.086
	Gaspé	.418	Sept-Îles	.251
	Granby*	.166	Shawinigan*	.087
	Joliette*	.093	Sherbrooke*	.235
	Lachute*	.354	Sorel*	.108
	La Tuque	.161	Thetford Mines*	.110
	Magog*	.154	Trois-Rivières*	.099
	Matane	.096	Val-d'Or*	.254
	Montmagny	.021	Valleyfield*	.148
	Rimouski*	.063	Victoriaville*	.049
ONTARIO REGION	Arnprior*	.528	Midland*	.572
	Barrie*	.362	North Bay	.601
	Belleville	.344	Orillia	.360
	Brantford*	.483	Oshawa*	.519
	Brockville	.363	Owen Sound	.232
	Chatham	.548	Pembroke*	.637
	Cobourg*	.289	Petawawa*	.512
	Cornwall	.573	Peterborough*	.287
	Guelph*	.529	Sarnia*	.499
	Haileybury*	.593	Sault Ste. Marie*	.701
	Hawkesbury*	.268	Simcoe	.427
	Kapuskasing	.571	Smiths Falls*	.331
	Kenora*	.710	Stratford	.488
	Kingston*	.410	Timmins*	.686
	Kirkland Lake	.672	Trenton*	.431
	Leamington	.718	Wallaceburg	.606
	Lincoln	.707	Woodstock	.460
	Lindsay	.279		
PRAIRIES REGION	Brandon	.569	Portage la Prairie	.614
	Flin Flon*	.696	Prince Albert	.742
	Grande Prairie	.720	Red Deer	.649
	Lethbridge	.724	Swift Current	.719
	Medicine Hat*	.690	Thompson	.749
	Moose Jaw	.617	Yorkton	.766
	North Battleford*	.749		
BRITISH COLUMBIA REGION	Chilliwack*	.671	Port Alberni*	.732
	Courtenay*	.492	Powell River	.586
	Cranbrook	.635	Prince George*	.689
	Dawson Creek	.676	Prince Rupert*	.745
	Kamloops*	.661	Terrace*	.723
	Kelowna*	.677	Trail*	.646
	Kitimat	.733	Vernon	.690
	Nanaimo*	.542	Williams Lake*	.678
	Penticton	.587		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Statistics Canada, *1971 Census of Canada: Population Ethnic Groups*, Cat. 92-723 (Ottawa: 1973); Statistics Canada, *1971 Census of Canada: Characteristics of Census Agglomerations*, Cat. 98-702 (Ottawa: 1974). Available in: D.M. Ray (ed.) *Canadian Urban Trends: National Perspective, Volume One* (Toronto and Ottawa: Copp Clark in association with the Ministry of State for Urban Affairs, 1976).

GRAPH 5. INDEX OF ETHNIC DIVERSITY (1971)
(Z Scores)

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SUMMERSIDE
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KINGSTON
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NEWCASTLE
LABRADOR CITY
BROCKVILLE
BARRIE
ORILLIA
LACHUTE
COWANSVILLE
BELLEVILLE
SMITHS FALLS
FREDERICTON
SYDNEY
KENTVILLE
SYDNEY MINES
COBOURG
PETERBOROUGH
LINDSAY
ROUYN
HAWKESBURY
VAL-D'OR
SEPT-ÎLES
SHERBROOKE
NEW GLASGOW
OWEN SOUND
CHARLOTTETOWN
EDMUNDSTON
TRURO
ASBESTOS
SAINT-JEAN
GRANBY
LA TUQUE
MAGOG
VALLEYFIELD
CORNER BROOK
BAIE-COMEAU
THETFORD MINES
SOREL
TROIS-RIVIÈRES
ALMA
MATANE
JOLIETTE
DRUMMONDVILLE
SHAWINIGAN
SAINT-JÉRÔME
GRAND FALLS
SAINT-HYACINTHE
DOLBEAU
RIMOUSKI
RIVIÈRE-DU-LOUP
SAINT-GEORGES
VICTORIAVILLE
MONTMAGNY

Weather forecasts, though not always appreciated, are of interest to all Canadians. Whether it is to be sunny or cloudy, rainy or clear, humid or dry, chilly or warm affects the quality of life of virtually everyone in many and diverse ways.

The regional climate, as characterized by the length and variation of seasonal conditions, can affect people's everyday activities, their physical health and psychological well-being, as well as their material requirements and lifestyle opportunities. Clearly, whether one goes sunbathing or skiing, mows the lawn or shovels the sidewalk, takes the children to the park or remain shut inside is directly influenced by the weather conditions of the day: temperature, precipitation, sunshine and wind.

The material necessities and lifestyle opportunities of individuals are influenced by the regional climate. For example, the expense incurred for home heating, the extent to which the home should be insulated, the warmth of winter apparel required and the degree to which the family car has to be winterized are largely dictated by the severity of the winter weather normally experienced in the local area. Similarly, the regional variations in climate suggest that there is considerably less opportunity for skiing, sledding, snowmobiling and other winter-time pursuits in Leamington and Nanaimo than there is in Prince Albert and Pembroke. By contrast, gardeners, golfers and beach-goers enjoy a longer summer season around Chatham and Chilliwack than they do near La Tuque and Labrador City.

Climatic variations also largely determine the demands placed on local governments for facilities and services. The municipal budget for snow removal is undoubtedly much higher in Timmins and Val d'Or than in Penticton and Wallaceburg. In like manner, engineering standards and associated construction and maintenance costs for municipal infrastructure co-vary with the severity of the local climate. As an example, the size of storm sewers, water reservoirs and other municipal engineering works are related to the volume, frequency and intensity of precipitation received. Similarly, the depth to which utilities are buried as well as the frequency of road repair are based in large part on the degree of ground frost penetration. As a result, the design and therefore the expense of basic municipal facilities is intimately linked to local climatic conditions.

The severity of air pollution is also affected by the climatic elements. A city produces its own air pollution, but it is the existing weather conditions which determine the significance of air pollution on the community. During the daytime, rising surface temperatures help to produce vertical currents which will increase the mixing depth and allow the pollution to disperse. Strong winds increase the ventilation of the city, clearing out the pollutants. The pollutant minimum occurs near the time of maximum solar heating in the early afternoon. Summer daytime heating is relatively high so that pollutants are disposed of readily, but low daytime heating in the winter months can do little to disperse pollutants. Fog and low cloud often accompany serious air pollution, inhibiting surface heating and making it more persistent.

On a more global basis, climatic characteristics can impart a distinctive image to the cities of a region, from fog-bound communities along the Atlantic coast to parched Prairie towns, from the sultry summer heat of southern Ontario to the snowbound mining centres of the North. Perhaps more importantly, the lifeblood of a community and its attractiveness to potential migrants can be sharply influenced by its climate. In large measure, retired people are drawn to the coastal centres of British Columbia by the moderate climate enjoyed in the region. Conversely, the long, bleak winters experienced in northern resource towns amplify the sense of isolation felt by the residents and increases the difficulty of recruiting and retaining a skilled labour force in these centres.

There are two types of weather information that can be used by individuals, industries and government agencies; one is the conventional weather forecast, the other is climatological data. The usefulness of the conventional forecast is generally limited to a period of a few days. Decisions involving a longer period of time must rely on climatic norms — averages, variations, frequencies and probabilities determined from long-term climatological data. The probability or risk of occurrence of a weather condition can be ascertained by a frequency analysis of a long record of past events. Quite detailed information can be developed from these records, such as the probability of a rainfall of 50 mm or more occurring within a 24-hour period during the first ten days of July. In this report, however, the focus is on summary measures such as annual or seasonal averages. For more detailed information, the reader is referred to the publications of the Atmospheric Environment Service, Environment Canada.

Given the significant impact that climatic factors exert on the quality of life of individuals, on the type and level of government services that people receive and on the overall attractiveness of an urban centre, knowledge of climatic attributes is important. Data are collected for a host of climatic characteristics, including mean cloud cover, average wind speed, mean air pressure, relative humidity, the mean frequency of thick fog, the average incidence of thunderstorms, the probability of receiving freezing rain and the like. In this study, however, indicators are provided for the most fundamental climatic variables: sunshine, precipitation and temperature.

TECHNICAL NOTES

The measures reported are climatic norms computed from daily recordings kept over a 30-year period from 1941 to 1970. The observations are collected by local monitoring stations, and then summarized and published by the Atmospheric Environment Service, Environment Canada.

Since weather monitoring stations were not located in each community under study, the norm recorded at a station in a nearby centre (within 8 to 40 kilometres) is reported in some cases. Although this method was only employed in regions where climatic characteristics appear to be relatively uniform, some error may have been introduced. Also, some observation stations began operations after 1941. In these cases, the climatic normals are based on a shorter time span and comparability of results with other communities is somewhat affected.

SUNSHINE

ANNUAL HOURS OF SUNSHINE (MEAN 1941-70)

ASPECT MEASURED

The presence or absence of sunshine influences and, in some cases, controls the pursuit of occupational and recreational outdoor activities and the level of participant satisfaction that can be obtained. The enjoyment of activities such as touring, cottaging, camping, swimming and skiing, for example, may be enhanced by the presence of sunshine. Although there exists a wide spectrum of individual responses to a given climatic situation, it is generally believed that most people usually prefer sunny weather to cloudy or stormy weather. To the extent that this is true, the more hours of sunshine received in a community, the higher the quality of life enjoyed by its residents.

The measure, annual hours of daily bright sunshine, is a climatic norm computed from daily recordings kept over a 30-year period from 1941 to 1970.[17] Measurements at each weather station are made with the Campbell-Stokes sunshine recorder in which the sun's rays are focussed on a suitable card by means of a glass sphere burning a track along the path of the sun's image.

DIFFICULTIES OF INTERPRETATION

The indicator, it should be noted, measures the duration of daily bright sunshine. There is, however, no simple relationship between the duration of sunshine and the intensity of radiation occuring at any station because of varying elevation angles at which sunshine is received, the reflectivity of the surroundings, the altitude and other factors.

GEOGRAPHIC PATTERN

The highest annual sunshine totals are found throughout the Prairie provinces in the centre of the continent where they range from 2000 to 2400 hours per year. The yearly duration of sunshine is lowest in communities along the Pacific coast where the range is 1000 to 1400 hours per annum (e.g., Prince Rupert, Kitimat). Due to the cloud cover associated with open water, sunshine totals only range around 1600 hours yearly over Hudson Bay and in adjacent parts of northern Ontario and northern Quebec (e.g., Rouyn, Val d'Or, Kapuskasing and Timmins). In Newfoundland, similar low annual totals have been recorded (e.g., Corner Brook). However, despite the presence of the ocean surface, the normals computed for communities in the Maritime Provinces range around 1800 hours, only slightly below those recorded in southern Quebec and southern Ontario.

OTHER MEASURES

The mean cloud amount in daylight hours, averaged over the year, has the inverse geographic pattern to the measure of mean annual hours of daily bright sunshine and could, therefore, serve as a substitute. Another typical measure is the total hours of sunshine received during the five summer months (May to September, inclusive), the period of the year when outdoor activity is greatest.

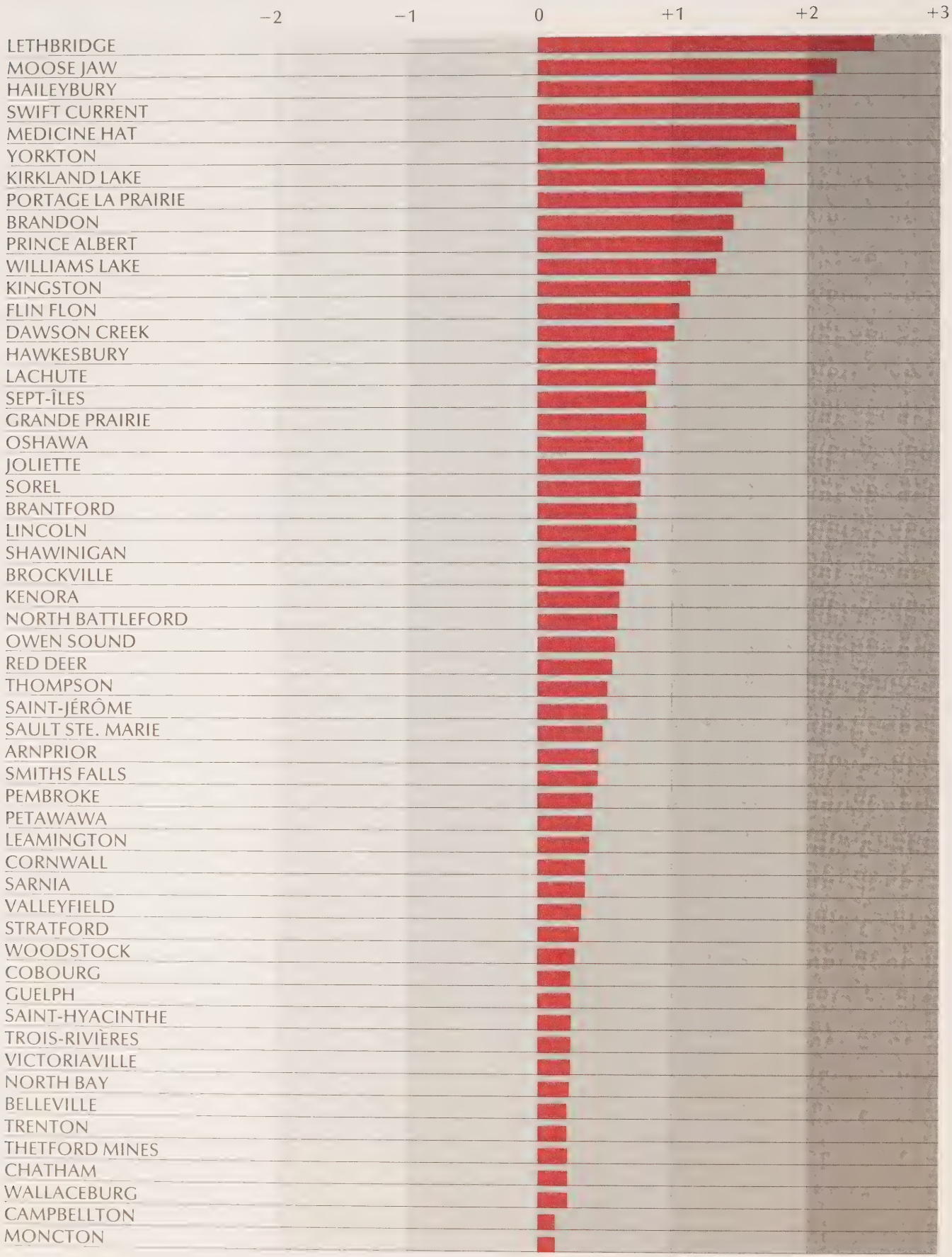
[17] B.J. Yorke and G.R. Kendall, *Daily Bright Sunshine, 1941-1970* (Downsview, Toronto: Atmospheric Environment Service, Environment Canada, 1972).

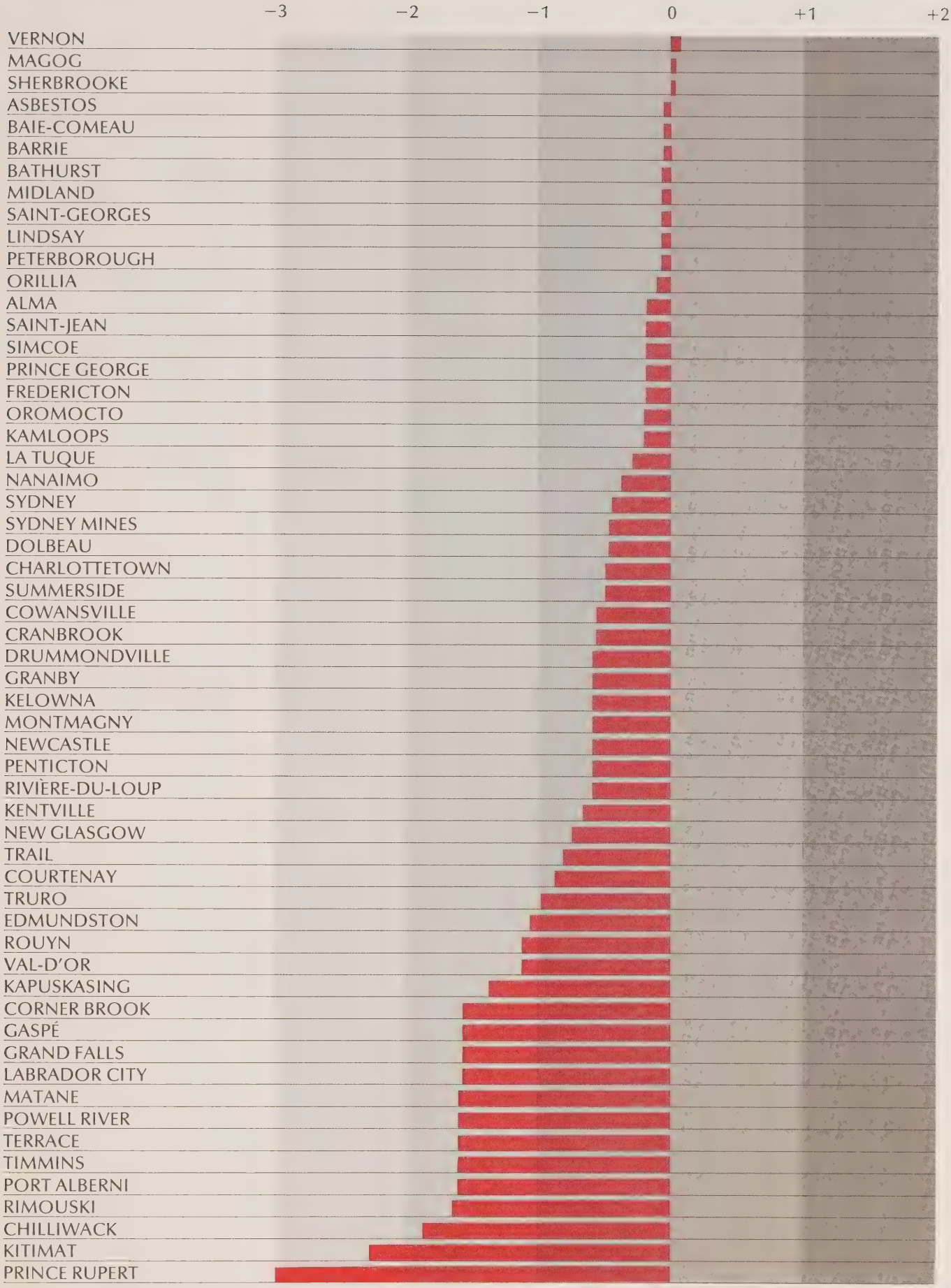
TABLE 7. ANNUAL HOURS OF SUNSHINE (MEAN 1941-70)

ATLANTIC REGION	Bathurst	1900	Moncton*	1918
	Campbellton*	1918	Newcastle*	1800
	Charlottetown*	1803	New Glasgow*	1775
	Corner Brook	1600	Oromocto	1863
	Edmundston	1700	Summerside*	1803
	Fredericton*	1863	Sydney*	1824
	Grand Falls*	1600	Sydney Mines*	1824
	Kentville*	1789	Truro*	1749
	Labrador City*	1600		
QUÉBEC REGION	Alma	1875	Rivière-du-Loup	1800
	Asbestos*	1900	Rouyn*	1692
	Baie-Comeau*	1900	Saint-Georges*	1900
	Cowansville	1800	Saint-Hyacinthe*	1950
	Dolbeau*	1817	Saint-Jean*	1872
	Drummondville*	1800	Saint-Jérôme*	2000
	Gaspé	1600	Sept-Îles	2051
	Granby*	1800	Shawinigan*	2020
	Joliette*	2043	Sherbrooke*	1902
	Lachute*	2063	Sorel*	2043
	La Tuque	1850	Thetford Mines*	1940
	Magog*	1902	Trois-Rivières*	1947
	Matane	1600	Val-d'Or*	1690
	Montmagny	1800	Valleyfield*	1961
	Rimouski*	1585	Victoriaville*	1947
ONTARIO REGION	Arnprior*	1995	Midland*	1900
	Barrie*	1900	North Bay	1945
	Belleville	1941	Orillia	1890
	Brantford*	2035	Oshawa*	2045
	Brockville	2000	Owen Sound	2000
	Chatham	1936	Pembroke*	1988
	Cobourg*	1950	Petawawa*	1988
	Cornwall	1970	Peterborough*	1895
	Guelph*	1950	Sarnia*	1968
	Haileybury*	2302	Sault Ste. Marie*	1999
	Hawkesbury*	2063	Simcoe	1869
	Kapuskasing	1635	Smiths Falls*	1995
	Kenora*	2000	Stratford	1954
	Kingston*	2113	Timmins*	1600
	Kirkland Lake	2200	Trenton*	1941
	Leamington	1980	Wallaceburg	1936
	Lincoln	2035	Woodstock	1954
	Lindsay	1895		
PRAIRIES REGION	Brandon	2157	Portage la Prairie	2200
	Flin Flon*	2100	Prince Albert	2143
	Grande Prairie	2050	Red Deer	2000
	Lethbridge	2387	Swift Current	2276
	Medicine Hat*	2252	Thompson	2000
	Moose Jaw	2338	Yorkton	2244
	North Battleford*	2000		
BRITISH COLUMBIA REGION	Chilliwack*	1539	Port Alberni*	1599
	Courtenay*	1751	Powell River	1600
	Cranbrook	1800	Prince George*	1865
	Dawson Creek	2100	Prince Rupert*	1036
	Kamloops*	1860	Terrace*	1600
	Kelowna*	1800	Trail*	1756
	Kitimat	1447	Vernon	1915
	Nanaimo*	1846	Williams Lake*	2142
	Penticton	1800		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: B.J. Yorke and G.R. Kendall, *Daily Bright Sunshine, 1941-1970* (Downsview, Toronto: Atmospheric Environment Service, Environment Canada, 1972).

GRAPH 6. ANNUAL HOURS OF SUNSHINE (MEAN 1941-70)
(Z Scores)

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MIDLAND
SAINT-GEORGES
LINDSAY
PETERBOROUGH
ORILLIA
ALMA
SAINT-JEAN
SIMCOE
PRINCE GEORGE
FREDERICTON
OROMOCTO
KAMLOOPS
LA TUQUE
NANAIMO
SYDNEY
SYDNEY MINES
DOLBEAU
CHARLOTTETOWN
SUMMERSIDE
COWANSVILLE
CRANBROOK
DRUMMONDVILLE
GRANBY
KELOWNA
MONTMAGNY
NEWCASTLE
PENTICTON
RIVIÈRE-DU-LOUP
KENTVILLE
NEW GLASGOW
TRAIL
COURTENAY
TRURO
EDMUNDSTON
ROUYN
VAL-D'OR
KAPUSKASING
CORNER BROOK
GASPÉ
GRAND FALLS
LABRADOR CITY
MATANE
POWELL RIVER
TERRACE
TIMMINS
PORT ALBERNI
RIMOUSKI
CHILLIWACK
KITIMAT
PRINCE RUPERT

PRECIPITATION

ANNUAL DAYS OF PRECIPITATION (MEAN 1941-70)

ASPECT MEASURED	The occurrence of precipitation can constrain the pursuit of occupational and recreational outdoor activities, as well as the level of satisfaction derived by the participants. Clearly, many outdoor activities such as gardening, golfing and picnicking are regarded by most people as far less enjoyable when it is raining. Although relatively rare, severe forms of precipitation such as blizzards, hail and thunderstorms can cause physical discomfort and injury due to flooded basements or hazardous driving. The volume and frequency of precipitation received in a community have implications for the design, construction and cost of municipal infrastructure such as storm sewers, reservoirs and water treatment facilities.	The measure, annual number of days of measurable precipitation, is a climatic norm computed from daily recordings kept over a 30-year period from 1941 to 1970.[18] Both rainfall and snowfall are recorded as precipitation. The minimum measurable amount is 0.25 mm. Rainfall is usually measured with a Standard Rain Gauge, which has a circular opening of 6452 mm and is placed 305 mm above level ground. Snowfall is generally taken as the depth of freshly fallen snow (measured with a ruler) in an area free from drifting, although many weather stations now employ a Snow Gauge.
DIFFICULTIES OF INTERPRETATION	The measure indicates the average number of days annually on which precipitation is likely to disrupt outdoor activities or events. However, this climatic norm provides no indication of the duration or intensity of the rainfall or snowfall received.	

[18]Atmospheric Environment Service, *Canadian Normals, Volume 2, Precipitation, 1941-70* (Downsview, Toronto: Environment Canada, 1973).

GEOGRAPHIC PATTERN

Communities nestled in the mountain ranges of British Columbia experience both the lowest and the highest annual number of days of recorded precipitation. Rainfall is induced by the cooling of moisture-laden air masses off the Pacific Ocean as they are forced over the coastal mountain ranges by the prevailing westerly winds. This process causes centres on the windward slopes (e.g., Prince Rupert, Kitimat, Terrace, Powell River, Nanaimo and Chilliwack) to receive frequent precipitation. By contrast, B.C. communities located on the leeward slopes (e.g., Kamloops, Kelowna, Dawson Creek, Penticton and Vernon) receive precipitation quite infrequently. Such places lie within a "rain shadow" where air masses warm and increase their capacity to retain moisture as they descend the mountain slopes.

Located in the middle of the continent, far from major bodies of water, Prairie communities average only about 100 days of measurable precipitation per year. However, cities of northern Ontario and Québec in relative proximity to Hudson Bay (e.g., Kapuskasing, Timmins, Val-d'Or and La Tuque) receive precipitation with much greater frequency 160 - 180 days per year. In the Atlantic Provinces, communities located inland experience considerably less rainfall and snowfall than coastal centres (e.g., Sydney, Corner Brook). In southern Ontario and Québec, precipitation is usually generated by the prevailing eastward movement of an alternating sequence of warm, cyclonic, low-pressure air masses and cold, anti-cyclonic, high-pressure air masses. The frontal activity thus produced causes precipitation of moderate frequency, about 140 days per annum.

OTHER MEASURES

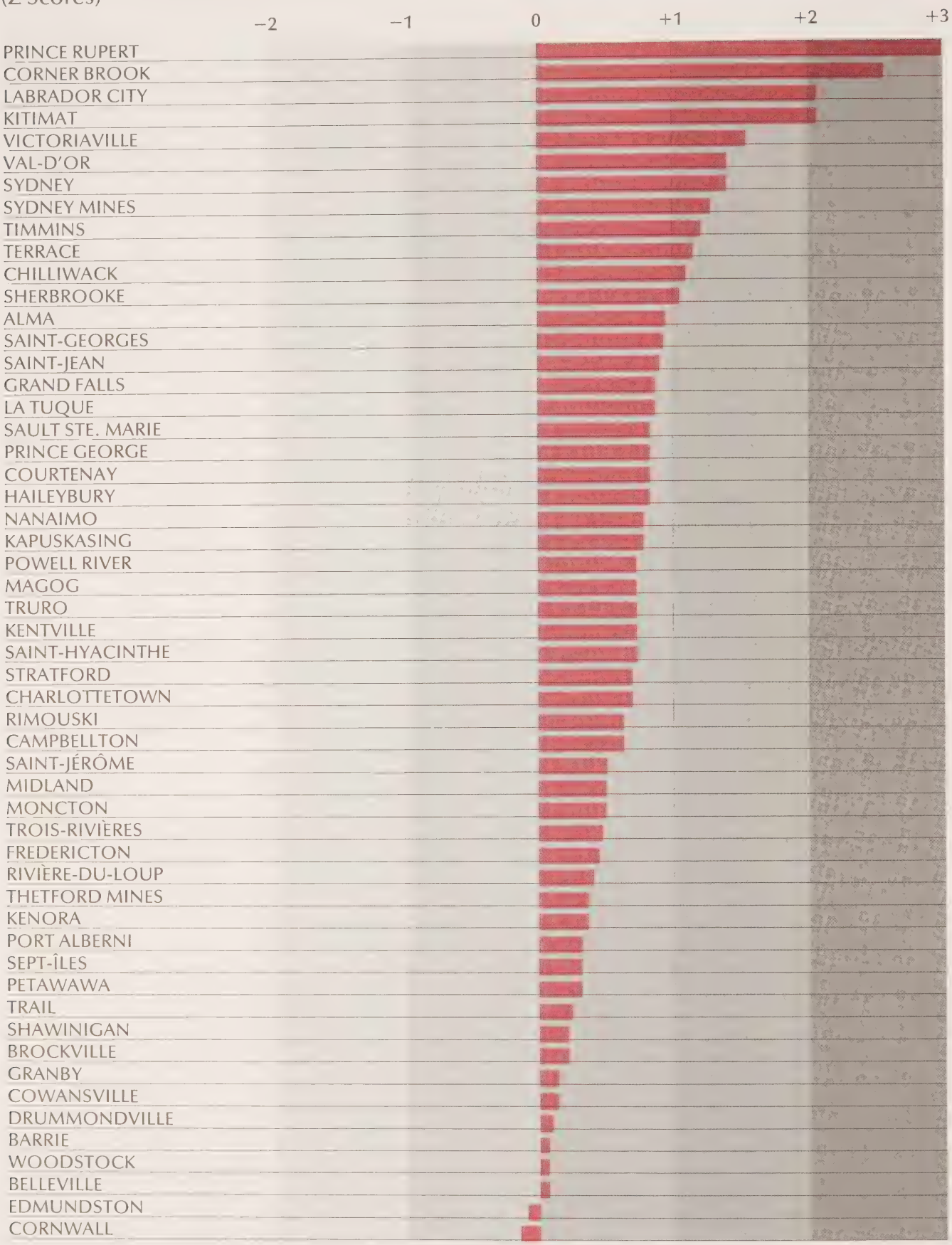
A variety of climatic norms exists for precipitation — averages, variations, frequencies, and probabilities — determined from long-term climatological data. The most commonly used summary measure is mean total precipitation received per annum. Also of utility are mean monthly totals which capture seasonal variations in precipitation levels. The degree of regularity or dependability of rainfall can be ascertained by determining the standard deviation of monthly precipitation in specific years from the mean monthly total for a period of years. Frequency measures, such as the number of times during the 30-year climatic period in which a 24-hour rainfall exceeding a given magnitude was received, are employed to ascertain the probability or risk of occurrence of a severe weather condition. The probability of a weather event, such as the most severe storm anticipated during a five-year period, may be used to determine the design capacity of public engineering works such as sewer systems, reservoirs and floodways, as well as the extent of "hazard lands" subject to periodic flooding where permanent structures should not be built.

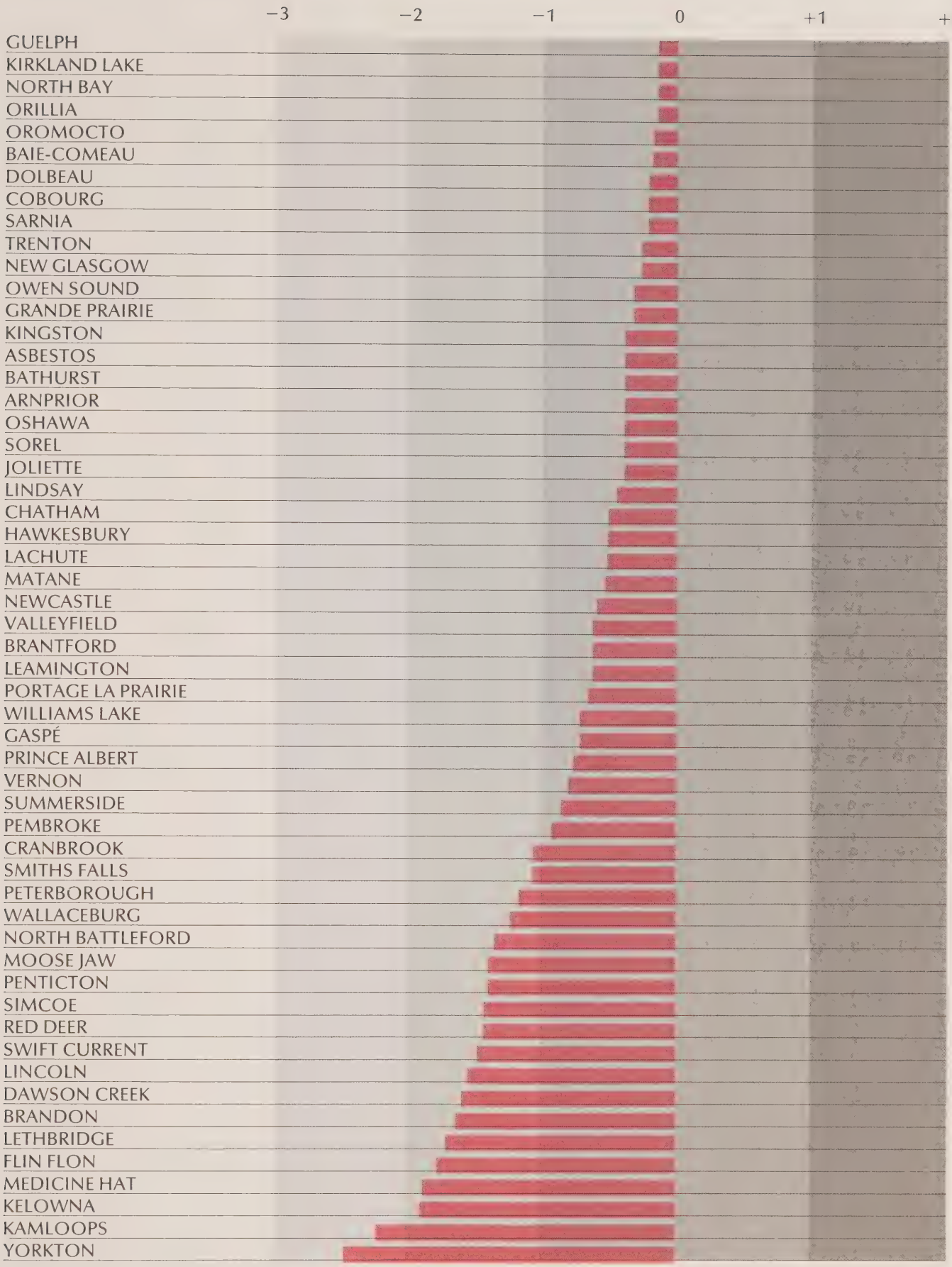
TABLE 8. ANNUAL DAYS OF PRECIPITATION (MEAN 1941-70)

ATLANTIC REGION	Bathurst	129	Moncton*	152
	Campbellton*	155	Newcastle*	122
	Charlottetown*	156	New Glasgow*	131
	Corner Brook	210	Oromocto	136
	Edmundston	139	Summerside*	117
	Fredericton*	151	Sydney*	179
	Grand Falls*	163	Sydney Mines*	179
	Kentville*	158	Truro*	159
	Labrador City*	195		
QUÉBEC REGION	Alma	168	Rivière-du-Loup	150
	Asbestos*	129	Rouyn*	+
	Baie-Comeau*	135	Saint-Georges*	165
	Cowansville	141	Saint-Hyacinthe*	158
	Dolbeau*	135	Saint-Jean*	164
	Drummondville*	141	Saint-Jérôme*	155
	Gaspé	119	Sept-Îles	146
	Granby*	143	Shawinigan*	145
	Joliette*	127	Sherbrooke*	170
	Lachute*	123	Sorel*	128
	La Tuque	163	Thetford Mines*	148
	Magog*	159	Trois-Rivières*	152
	Matane	123	Val-d'Or*	180
	Montmagny	+	Valleyfield*	123
	Rimouski*	156	Victoriaville*	181
ONTARIO REGION	Arnprior*	128	Midland*	152
	Barrie*	140	North Bay	136
	Belleville	139	Orillia	136
	Brantford*	121	Oshawa*	128
	Brockville	144	Owen Sound	131
	Chatham	126	Pembroke*	114
	Cobourg*	132	Petawawa*	146
	Cornwall	137	Peterborough*	109
	Guelph*	136	Sarnia*	132
	Haileybury*	161	Sault Ste. Marie*	163
	Hawkesbury*	123	Simcoe	100
	Kapuskasing	160	Smiths Falls*	109
	Kenora*	147	Stratford	157
	Kingston*	130	Timmins*	174
	Kirkland Lake	136	Trenton*	132
	Leamington	121	Wallaceburg	107
	Lincoln	97	Woodstock	140
	Lindsay	127		
PRAIRIES REGION	Brandon	93	Portage la Prairie	121
	Flin Flon*	92	Prince Albert	119
	Grande Prairie	130	Red Deer	98
	Lethbridge	93	Swift Current	98
	Medicine Hat*	89	Thompson	+
	Moose Jaw	101	Yorkton	69
	North Battleford*	104		
BRITISH COLUMBIA REGION	Chilliwack*	172	Port Alberni*	147
	Courtenay*	161	Powell River	160
	Cranbrook	113	Prince George*	162
	Dawson Creek	96	Prince Rupert*	227
	Kamloops*	77	Terrace*	173
	Kelowna*	88	Trail*	146
	Kitimat	195	Vernon	118
	Nanaimo*	161	Williams Lake*	120
	Penticton	100		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Atmospheric Environment Service, *Canadian Normals, Volume 2: Precipitation, 1941-70* (Downsview, Toronto: Environment Canada, 1975).

GRAPH 7. ANNUAL DAYS OF PRECIPITATION (MEAN 1941-70)
(Z Scores)

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DOLBEAU
COBOURG
SARNIA
TRENTON
NEW GLASGOW
OWEN SOUND
GRANDE PRAIRIE
KINGSTON
ASBESTOS
BATHURST
ARNPRIOR
OSHAWA
SOREL
JOLIETTE
LINDSAY
CHATHAM
HAWKESBURY
LACHUTE
MATANE
NEWCASTLE
VALLEYFIELD
BRANTFORD
LEAMINGTON
PORTAGE LA PRAIRIE
WILLIAMS LAKE
GASPÉ
PRINCE ALBERT
VERNON
SUMMERSIDE
PEMBROKE
CRANBROOK
SMITHS FALLS
PETERBOROUGH
WALLACEBURG
NORTH BATTLEFORD
MOOSE JAW
PENTICTON
SIMCOE
RED DEER
SWIFT CURRENT
LINCOLN
DAWSON CREEK
BRANDON
LETHBRIDGE
FLIN FLON
MEDICINE HAT
KELOWNA
KAMLOOPS
YORKTON

ANNUAL DAYS OF SNOWCOVER (MEAN 1941-60)

ASPECT MEASURED	Snow affects the quality of life of people in diverse ways. To the very young and the young-at-heart, the first snowfall of winter conjures up visions of beautiful snowy landscapes and the pleasures of winter recreation. To the more sober come thoughts of wet overshoes, heavy clothing, driveways to be shovelled, snow tires and the frustrations of winter driving. As an asset, the presence of snow or ice cover is necessary for winter-season activities such as skiing, ice skating, snowmobiling and snow-shoeing. As a liability, some losses attributed to snowcover are delays and disruptions in the transportation system, the cost of clearing snow and ice from roads and the cost of maintaining our means of communications and power supply. Personal accidents and injuries due to snow and ice may also occur, in addition to property damage.	The measure, annual number of days of snow cover, is a climatic norm computed from daily recordings over a 20-year period from 1941 to 1960.[19] It represents the median number of days per year for which the accumulation of snow lying on the ground exceeds 25 mm. The depth of snow on the ground, including the depth of any layers of ice which are present, is measured on a daily basis with a ruler (the average for a series of measurements is taken) in an area free from drifting.
DIFFICULTIES OF INTERPRETATION	Since many of the monitoring stations are located at airports where severe drifting can occur, it is often difficult to obtain representative measurements of snow cover. As a corollary, the data presented are primarily representative of exposed sites and not of sheltered locations.	

[19] J.G. Potter, *Snow Cover* (Toronto: Meteorological Branch, Department of Transport, Climatological Studies Number 3, 1965).

GEOGRAPHIC PATTERN

Given the substantial variations in latitude, topography, prevailing winds, proximity to bodies of water and other factors that influence Canada's weather conditions, it is not surprising that significant differences in the median length of snow cover occur between communities across the nation. In the majority of winter seasons, the residents of Nanaimo will see no appreciable snow cover whatsoever. In contrast, the inhabitants of Thompson and Labrador City habitually endure "the white stuff" for over six months per year.

British Columbia is a study in contrasts. In this region, there are great variations in snow cover over short distances resulting from the rugged terrain and the proximity of the Pacific Ocean. The accumulation of snow on the western mountain slopes, especially the Coast Range, is deeper than any other area of Canada, yet snow cover in the valleys situated in the lee of the mountain ranges may be quite shallow. In coastal communities, the moderating influence of the Pacific is strong. Hence, the median length of snow cover is negligible, with snowfall from individual storms usually melting shortly after formation (e.g., Nanaimo, Powell River, Prince Rupert, Courtenay and Chilliwack). For communities in the interior, snow cover is normally less in the valleys nearest the coast and progressively deeper in the valleys to the northeast. As an example, the duration of snow cover increases from 30-50 days in southern B.C. centres such as Penticton and Kamloops to 130-150 days in central and northeastern locations such as Prince George and Dawson Creek.

The duration of snow cover varies considerably across the Prairies. In the communities of southeastern Alberta, where snow cover may disappear under chinook conditions, the ground is typically snow-covered for less than 100 days per winter (e.g., Lethbridge, Medicine Hat). Away from this area of least duration, the days of snow cover increase to the 140-150 range over the northern agricultural regions (e.g., Portage la Prairie, Yorkton, Prince Albert, North Battleford, Grande Prairie). Farther to the northeast in Saskatchewan and Manitoba, the snow cover persists for longer periods, and near the shores of Hudson Bay, the duration approaches 200 days per annum (e.g., Flin Flon, Thompson).

In Eastern Canada, the division between the two main snow cover regions extends from the Gulf of St. Lawrence along the northern limits of the St. Lawrence lowlands and then westward to Lake Superior. In communities north of this line, snow cover usually lasts considerably more than 150 days per annum. Snow cover normally persists slightly longer in central Québec (e.g., Val-d'Or, La Tuque, Sept-Îles) than in northern Ontario (e.g., North Bay, Haileybury, Timmins). But, in communities south of this line encompassing southern Ontario, the St. Lawrence lowlands and the Atlantic provinces, the snow-cover season is much shorter, lasting 115-145 days on average. Moreover, snow accumulation is typically much less since the periodic incursion of warm air gives rise to winter thaws. And, in the southern-most part of Ontario, near the moderating influence of Lake Ontario and Lake Erie, the snow-cover period decreases rapidly, seldom exceeding 60-70 days per year (e.g., Leamington, Chatham, Cobourg, Belleville).

OTHER MEASURES

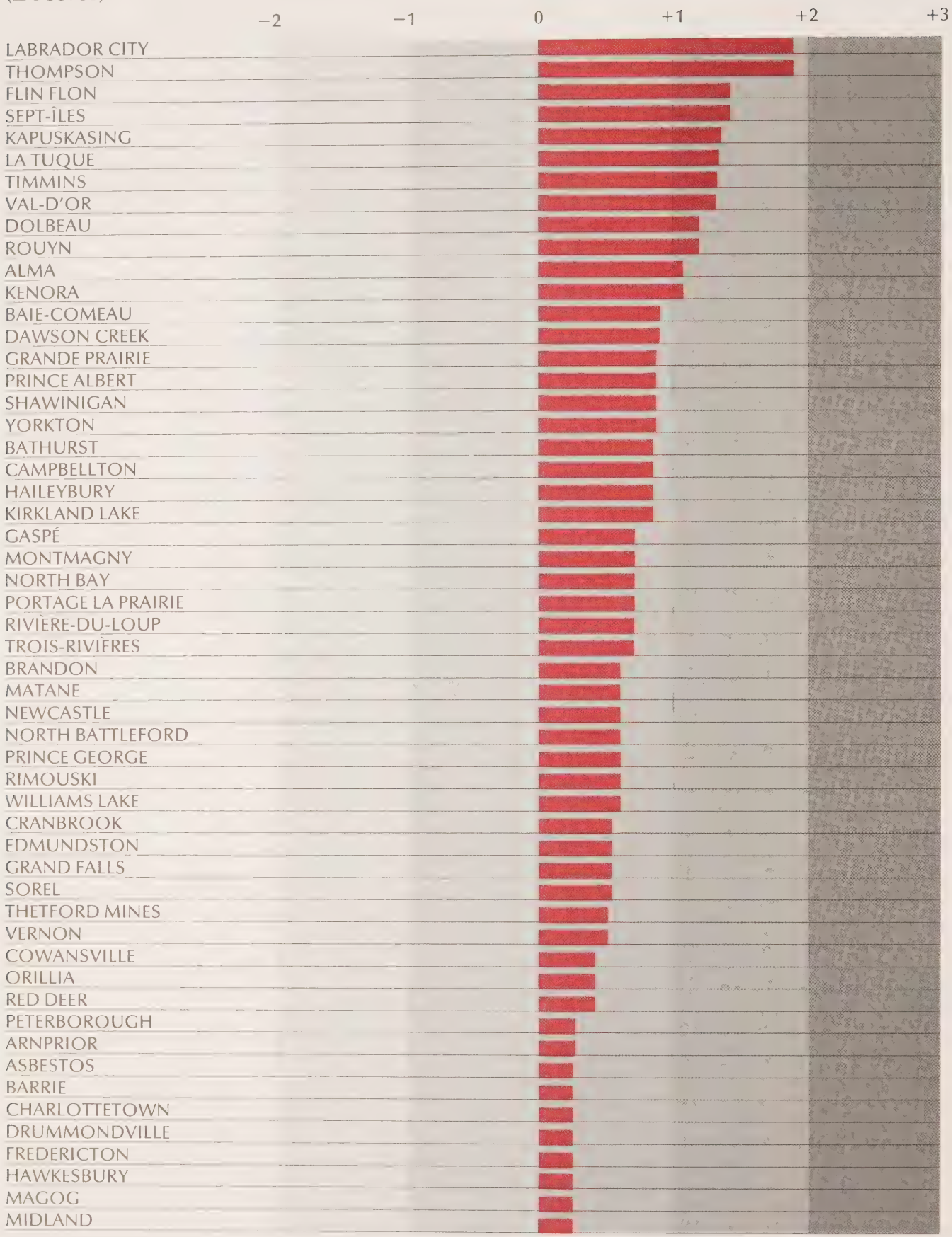
Alternate recorded measures of snowfall accumulation are the median date at which appreciable snow cover first occurs each winter, the median date of the last occurrence of snow cover in the spring, the depth of snow cover at the end of each month and the maximum snow depth during the winter season. Another type of measure is the rate of snowfall. Clearly, such measurements may be recorded and computed for an individual storm or for different time spans (i.e., day, month, year). Snowfall totals may then be expressed as averages, standard deviations, frequency or probabilities of occurrence. Also of interest to citizens and public agencies is the likely incidence of other forms of winter precipitation such as freezing rain.

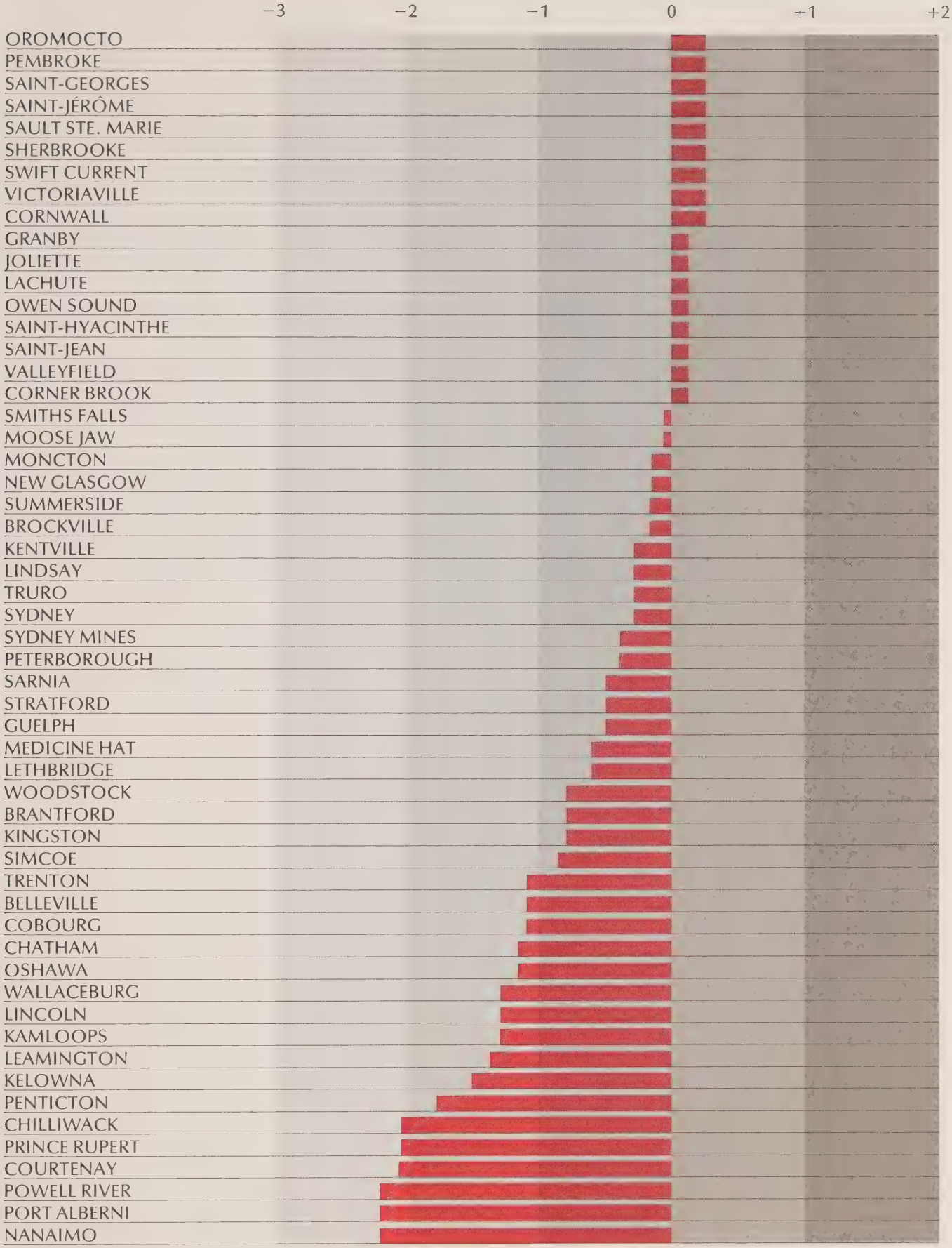
TABLE 9. ANNUAL DAYS OF SNOWCOVER (MEAN 1941-60)

ATLANTIC REGION	Bathurst	145	Moncton*	105
	Campbellton*	145	Newcastle*	135
	Charlottetown*	120	New Glasgow*	105
	Corner Brook	110	Oromocto	120
	Edmundston	130	Summerside*	95
	Fredericton*	120	Sydney*	95
	Grand Falls*	130	Sydney Mines*	100
	Kentville*	100	Truro*	+
	Labrador City*	190		
QUÉBEC REGION	Alma	155	Rivière-du-Loup	140
	Asbestos*	120	Rouyn*	160
	Baie-Comeau*	150	Saint-Georges*	120
	Cowansville	125	Saint-Hyacinthe*	115
	Dolbeau*	160	Saint-Jean*	115
	Drummondville*	120	Saint-Jérôme*	120
	Gaspé	140	Sept-Îles	170
	Granby*	115	Shawinigan*	150
	Joliette*	115	Sherbrooke*	120
	Lachute*	115	Sorel*	130
	La Tuque	165	Thetford Mines*	130
	Magog*	120	Trois-Rivières*	140
	Matane	135	Val-d'Or*	165
	Montmagny	140	Valleyfield*	115
	Rimouski*	135	Victoriaville*	120
ONTARIO REGION	Arnprior*	120	Midland*	120
	Barrie*	120	North Bay	140
	Belleville	65	Orillia	125
	Brantford*	75	Oshawa*	60
	Brockville	100	Owen Sound	115
	Chatham	60	Pembroke*	120
	Cobourg*	65	Petawawa*	120
	Cornwall	115	Peterborough*	90
	Guelph*	85	Sarnia*	90
	Haileybury*	145	Sault Ste. Marie*	120
	Hawkesbury*	120	Simcoe	70
	Kapuskasing	165	Smiths Falls*	110
	Kenora*	155	Stratford	90
	Kingston*	70	Timmins*	165
	Kirkland Lake	145	Trenton*	70
	Leamington	40	Wallaceburg	60
	Lincoln	55	Woodstock	80
	Lindsay	100		
PRAIRIES REGION	Brandon	135	Portage la Prairie	140
	Flin Flon*	170	Prince Albert	150
	Grande Prairie	150	Red Deer	125
	Lethbridge	80	Swift Current	120
	Medicine Hat*	85	Thompson	190
	Moose Jaw	105	Yorkton	150
	North Battleford*	135		
BRITISH COLUMBIA REGION	Chilliwack*	20	Port Alberni*	5
	Courtenay*	10	Powell River	10
	Cranbrook	130	Prince George*	135
	Dawson Creek	150	Prince Rupert*	20
	Kamloops*	50	Terrace*	4
	Kelowna*	30	Trail*	4
	Kitimat	+	Vernon	130
	Nanaimo*	0	Williams Lake*	135
	Penticton	30		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: J.G. Potter, *Snow Cover* (Toronto: Meteorological Branch, Department of Transport, Climatological Studies Number 3, 1965).

GRAPH 8. ANNUAL DAYS OF SNOWCOVER (MEAN 1941-60)
(Z Scores)




−3
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0
+1
+2
OROMOCTO
PEMBROKE
SAINT-GEORGES
SAINT-JÉRÔME
SAULT STE. MARIE
SHERBROOKE
SWIFT CURRENT
VICTORIAVILLE
CORNWALL
GRANBY
JOLIETTE
LACHUTE
OWEN SOUND
SAINT-HYACINTHE
SAINT-JEAN
VALLEYFIELD
CORNER BROOK
SMITHS FALLS
MOOSE JAW
MONCTON
NEW GLASGOW
SUMMERSIDE
BROCKVILLE
KENTVILLE
LINDSAY
TRURO
SYDNEY
SYDNEY MINES
PETERBOROUGH
SARNIA
STRATFORD
GUELPH
MEDICINE HAT
LETHBRIDGE
WOODSTOCK
BRANTFORD
KINGSTON
SIMCOE
TRENTON
BELLEVILLE
COBOURG
CHATHAM
OSHAWA
WALLACEBURG
LINCOLN
KAMLOOPS
LEAMINGTON
KELOWNA
PENTICTON
CHILLIWACK
PRINCE RUPERT
COURTENAY
POWELL RIVER
PORT ALBERNI
NANAIMO

TEMPERATURE

JULY TEMPERATURE (MEAN 1941-70)

ASPECT MEASURED

Another aspect of climate that strongly influences personal comfort as well as the pursuit of outdoor activities is the daily temperature. One is less likely to play tennis, weed the garden or perform other vigorous activities at 30°C, just as one is less inclined to go sunbathing or swimming at 15°C.

The measure, mean July temperature, is the average of the mean daily maximum and mean daily minimum temperatures for the month of July computed from daily recordings taken over a thirty-year period from 1941 to 1970.[20] Measurements at each weather station are made two or four times per day with self-registered mercury maximum and spirit minimum thermometers suspended four feet above the ground in a standard shelter. Ideally, each thermometer is installed in the most representative location possible, over level, grassy terrain in a spot away from the sheltering influence of trees and buildings.

DIFFICULTIES OF INTERPRETATION

The measure provides an overall indication of temperature conditions experienced in a city, but provides no information on the diurnal temperature range, nor the maximum or minimum temperatures experienced, all of which may more directly affect human comfort.

Also, the location of many observation stations at airports on the outskirts of cities means that the heating effect on urban areas is not normally reflected in the measures. Bare ground, stone, cement and asphalt surfaces absorb solar radiation more readily than fields and forests, thus resulting in built-up areas becoming warmer than surrounding rural areas. Similarly, urban heat sources such as heated buildings and pollutants moderate radiational cooling in the evening hours. Consequently, the extent to which urban heating effects are not captured by the monitoring stations may result in a slight but consistent downward bias in the temperatures reported.

[20]Atmospheric Environment Service, *Canadian Normals, Volume 1: Temperature, 1941-70* (Downsview, Toronto: Environment Canada, 1973).

GEOGRAPHIC PATTERN

Temperature levels are influenced by a host of factors including latitude, altitude, proximity to water bodies, cloud cover and surface reflectivity as well as the sequence of cold and warm air masses that flow through a region. As a result, the regional variation in mean July temperature is considerable. The cooling influence of the Pacific coupled with substantial cloud cover, as an example, significantly moderates the temperature levels of B.C. coastal centres (e.g., Prince Rupert, Port Alberni, Terrace, Kitimat and Nanaimo). In like manner, proximity to water moderates temperatures in the Atlantic region where no community has a mean July temperature exceeding 20°C. The extent to which temperature levels are governed by the intensity of solar radiation received is clearly observable. Communities which receive less solar radiation due to their northerly location experience lower average July temperatures (e.g., Dawson Creek, Grande Prairie, Kapuskasing, Dolbeau, Sept-Îles and Labrador City). Similarly, the most southerly cities enjoy higher July temperatures, with some centres exceeding 22°C (e.g., Leamington, Lincoln and Chatham). The absence of the moderating influences of water bodies in the middle of the continent results in somewhat higher temperatures, as some Prairie communities average above 20°C (i.e., Portage la Prairie, Medicine Hat).

OTHER MEASURES

A variety of climatic norms exist for temperature — averages, variations, extremes, frequencies and probabilities — which may be determined from long-term climatological data for varying time spans — per day, per month, per annum. Some of the more widely used summary measures are the mean maximum monthly temperature and the corresponding mean minimum figure. Other measures include: the range of daily maximum and daily minimum temperatures recorded for the month during the 30-year climatic period, and frequency measures such as the rate of occurrence of a daily maximum of 30°C during July, as tabulated from the 30-year climatic record. The probable occurrence in the future of a specified temperature level during a particular time period may then be computed from the frequencies tabulated.

In Eastern Canada, which often falls under the influence of hot, humid air masses flowing into the region from more southerly locations, temperature itself is not a sufficient indicator of human comfort. In such instances, a combined measure is needed which includes both temperature and humidity. Typically, the water vapour content in the air is expressed as relative humidity, the ratio of the actual water vapour present in the air to the potential saturation level at a given temperature. Another measure which reflects the composite effect of both humidity and heat is the humidex, the temperature of dry air equivalent in comfort to air of a specific temperature and moisture content.[21] For example, with a temperature of 32°C and relative humidity of 50 per cent, the humidex is 39°C. Although the level of comfort is obviously subjective and varies with individuals, the humidex provides a rough indication of the average discomfort experienced.

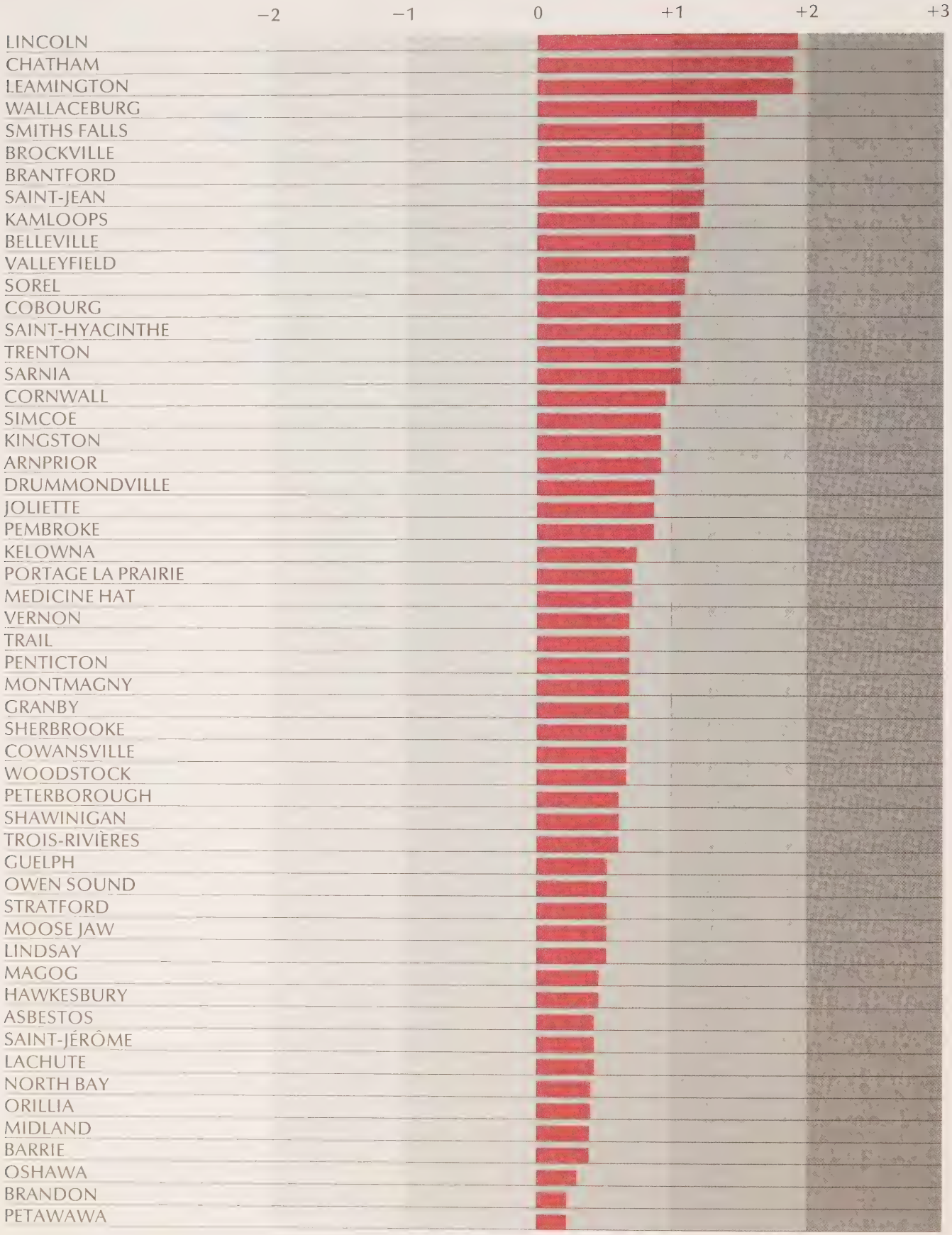
[21]Atmospheric Environment Service, Environment Canada, *Humidex* (Downsview, Toronto: Pub. 1/5, May 1979).

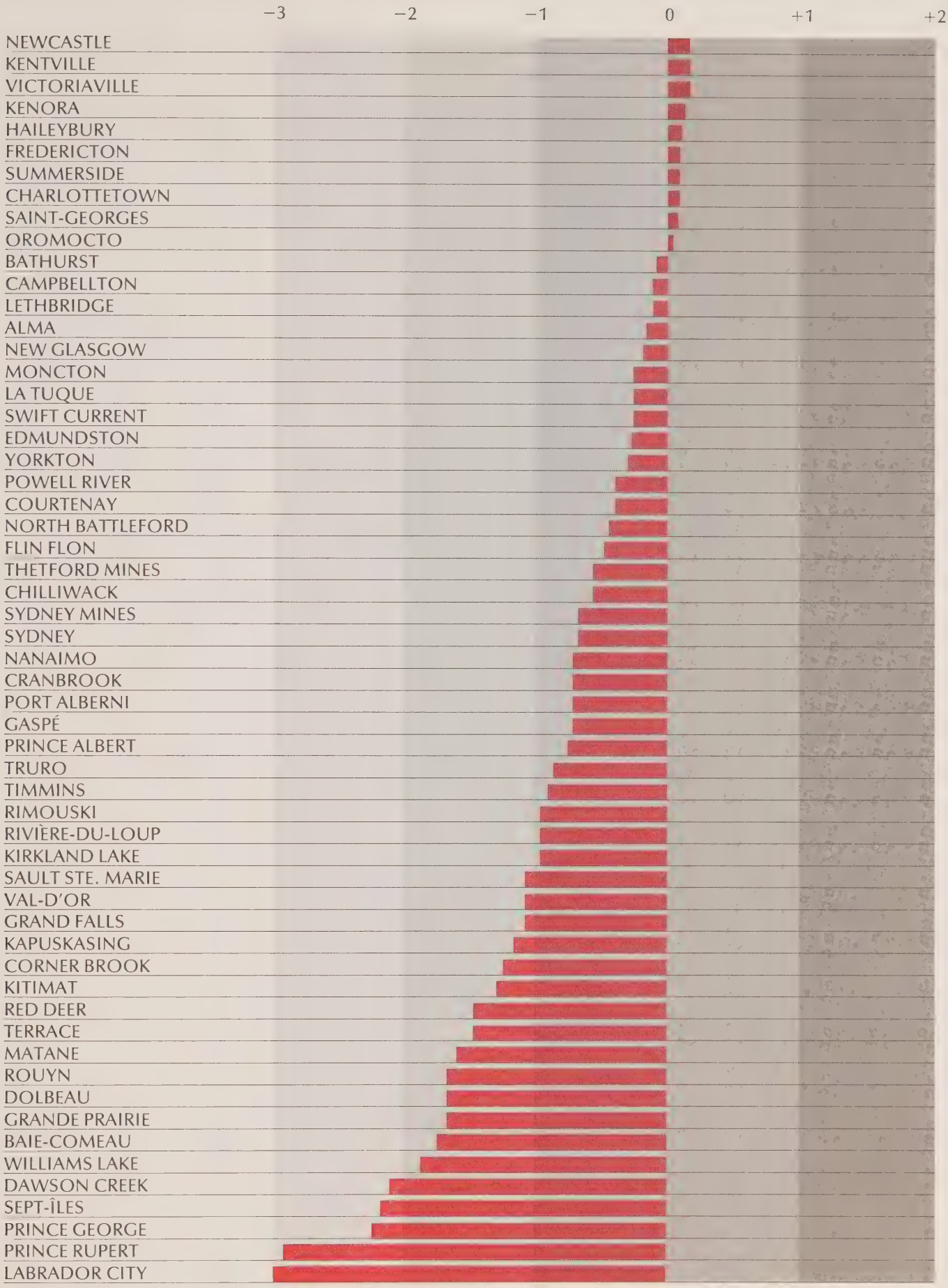
TABLE 10. JULY TEMPERATURE (°C) (MEAN 1941-70)

ATLANTIC REGION	Bathurst	18.9	Moncton*	18.6
	Campbellton*	18.8	Newcastle*	19.2
	Charlottetown*	19.0	New Glasgow*	18.7
	Corner Brook	16.9	Oromocto	18.9
	Edmundston	18.5	Summerside*	19.0
	Fredericton*	19.0	Sydney*	17.9
	Grand Falls*	17.0	Sydney Mines*	17.9
	Kentville*	19.1	Truro*	17.5
	Labrador City*	12.8		
QUÉBEC REGION	Alma	18.7	Rivière-du-Loup	17.1
	Asbestos*	19.5	Rouyn*	16.1
	Baie-Comeau*	15.9	Saint-Georges*	19.0
	Cowansville	20.0	Saint-Hyacinthe*	20.7
	Dolbeau*	16.0	Saint-Jean*	21.1
	Drummondville*	20.5	Saint-Jérôme*	19.5
	Gaspé	17.7	Sept-Îles	15.1
	Granby*	20.0	Shawinigan*	19.9
	Joliette*	20.5	Sherbrooke*	20.0
	Lachute*	19.5	Sorel*	20.7
	La Tuque	18.6	Thetford Mines*	18.1
	Magog*	19.7	Trois-Rivières*	19.9
	Matane	16.2	Val-d'Or*	17.0
	Montmagny	20.1	Valleyfield*	21.0
	Rimouski*	17.2	Victoriaville*	19.2
ONTARIO REGION	Arnprior*	20.5	Midland*	19.4
	Barrie*	19.4	North Bay	19.5
	Belleville	21.0	Orillia	19.4
	Brantford*	21.1	Oshawa*	19.4
	Brockville	21.1	Owen Sound	19.7
	Chatham	22.2	Pembroke*	20.4
	Cobourg*	20.7	Petawawa*	19.2
	Cornwall	20.7	Peterborough*	20.0
	Guelph*	19.7	Sarnia*	20.7
	Haileybury*	19.1	Sault Ste. Marie*	17.0
	Hawkesbury*	19.6	Simcoe	20.6
	Kapuskasing	17.0	Smiths Falls*	21.1
	Kenora*	19.1	Stratford	19.7
	Kingston*	20.5	Timmins*	17.4
	Kirkland Lake	17.1	Trenton*	20.7
	Leamington	22.1	Wallaceburg	21.7
	Lincoln	22.4	Woodstock	20.0
	Lindsay	19.7		
PRAIRIES REGION	Brandon	19.2	Portage la Prairie	20.2
	Flin Flon*	18.2	Prince Albert	17.6
	Grande Prairie	16.0	Red Deer	16.5
	Lethbridge	18.8	Swift Current	18.6
	Medicine Hat*	20.2	Thompson	+
	Moose Jaw	19.7	Yorkton	18.5
	North Battleford*	18.3		
BRITISH COLUMBIA REGION	Chilliwack*	18.1	Port Alberni*	17.7
	Courtenay*	18.4	Powell River	18.4
	Cranbrook	17.7	Prince George*	14.9
	Dawson Creek	15.2	Prince Rupert*	13.5
	Kamloops*	21.1	Terrace*	16.5
	Kelowna*	20.2	Trail*	20.1
	Kitimat	16.7	Vernon	20.1
	Nanaimo*	17.7	Williams Lake*	15.7
	Penticton	20.1		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Atmospheric Environment Service, *Canadian Normals, Volume 1: Temperature 1941-70* (Downsview, Toronto: Environment Canada, 1973).

GRAPH 9. JULY TEMPERATURE (°C) (MEAN 1941-70)
(Z Scores)




−3
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NEWCASTLE
KENTVILLE
VICTORIAVILLE
KENORA
HAILEYBURY
FREDERICTON
SUMMERSIDE
CHARLOTTETOWN
SAINT-GEORGES
OROMOCTO
BATHURST
CAMPBELLTON
LETHBRIDGE
ALMA
NEW GLASGOW
MONCTON
LA TUQUE
SWIFT CURRENT
EDMUNDSTON
YORKTON
POWELL RIVER
COURTENAY
NORTH BATTLEFORD
FLIN FLON
THETFORD MINES
CHILLIWACK
SYDNEY MINES
SYDNEY
NANAIMO
CRANBROOK
PORT ALBERNI
GASPÉ
PRINCE ALBERT
TRURO
TIMMINS
RIMOUSKI
RIVIÈRE-DU-LOUP
KIRKLAND LAKE
SAULT STE. MARIE
VAL-D'OR
GRAND FALLS
KAPUSKASING
CORNER BROOK
KITIMAT
RED DEER
TERRACE
MATANE
ROUYN
DOLBEAU
GRANDE PRAIRIE
BAIE-COMEAU
WILLIAMS LAKE
DAWSON CREEK
SEPT-ÎLES
PRINCE GEORGE
PRINCE RUPERT
LABRADOR CITY

ASPECT MEASURED	Chills, frostbite, heavy clothing, high home-heating bills and cars that fail to start are some of the discomforts, inconveniences and expenses that most Canadians face during the cold January weather. But, balanced against these negative aspects of quality of life are the pleasures that many derive from wintertime pursuits such as skiing, skating and snowmobiling.	The measure, mean January temperature, is defined, recorded, calculated and summarized in the same manner as mean July temperature. The difficulties of interpretation are also similar to those previously cited.
GEOGRAPHIC PATTERN	Factors such as latitude, altitude, the moderating influence of oceans and lakes as well as prevailing winds and weather systems combine to create a highly variable temperature pattern across Canada. The warming effect of the Pacific Ocean causes average January temperatures along the B.C. coast to remain above freezing (e.g., Nanaimo, Chilliwack, Courtenay, Powell River and Prince Rupert). By contrast, Prairie communities which lie in the path of Arctic air masses sweeping down from the north feel the full effect of winter cold as evidenced by average temperatures in the -15°C to -20°C range. Exceptions to this rule, however, are the cities of the southwestern Prairies where warm spells under chinook conditions are periodically experienced (i.e., Lethbridge, Medicine Hat and Swift Current). In southern	Ontario centres, proximity to the Great Lakes and the southerly latitude are reflected by average temperatures ranging from -4°C to -9°C. January temperatures in the St. Lawrence lowlands and Eastern Townships are quite uniform, generally lying within the -10°C to -12°C interval. Along the east coast, the Atlantic Ocean moderates temperature levels, which hover in the -4°C to -9°C range. Only in northern New Brunswick do Maritime cities endure average January temperatures of -10°C or lower (e.g., Bathurst, Campbellton and Edmundston). However, the residents of northern resource communities suffer the coldest January temperatures. For example, the January averages in Flin Flon, Prince Albert and Labrador City dip below -20°C.
OTHER MEASURES	As in the case of other climatic characteristics, various aspects of temperature for the coldest month of the year may be expressed by an array of averages, variations, frequencies and probabilities. One particular measure designed to reflect more accurately the degree of human discomfort caused by the combination of cold winds and low temperatures is the wind chill index. This index measures the effect of wind in intensifying the sensation of cold. It may be expressed as an effective temperature which equates the effect of a given temperature and wind speed combination (e.g., -5°C, 48 k/h) to a lower temperature and standard low wind speed (e.g., -23°C, 8 k/h).[22]	Another measure that has gained in prominence as the need to conserve energy has increased is "heating degree days". Obtained by subtracting the daily mean temperature from 18°C, the number of heating degree days provides information relevant to building design and insulation standards as well as fuel consumption calculations.[23]

[22]Meteorological branch, *Windchill Tables* (Toronto: Department of Transport, DS #5-67, 1967).

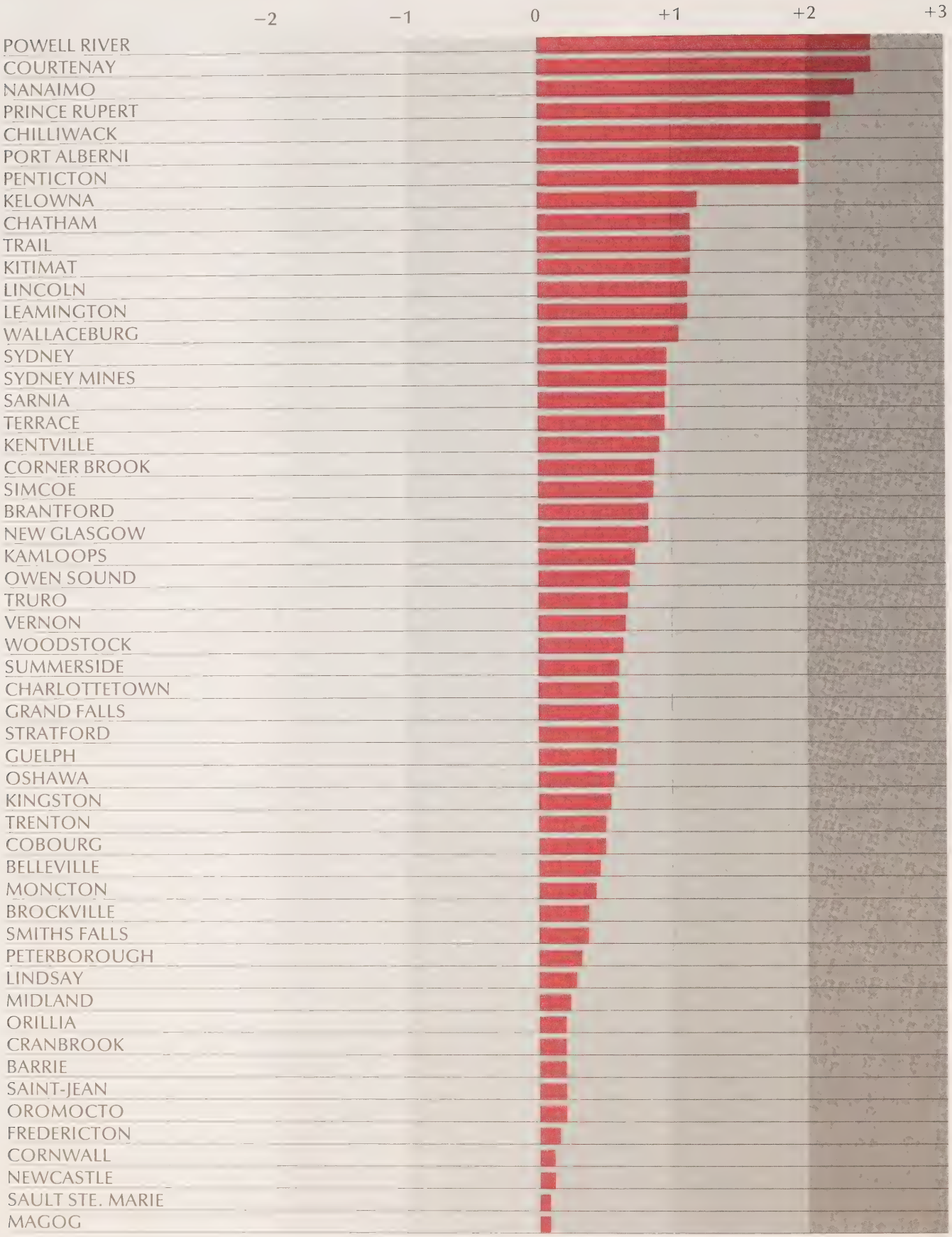
[23]Associate Committee on the National Building Code, *Climatic Information for Building Design in Canada, 1975* (Ottawa: National Research Council of Canada, NRC No. 13986, 1975).

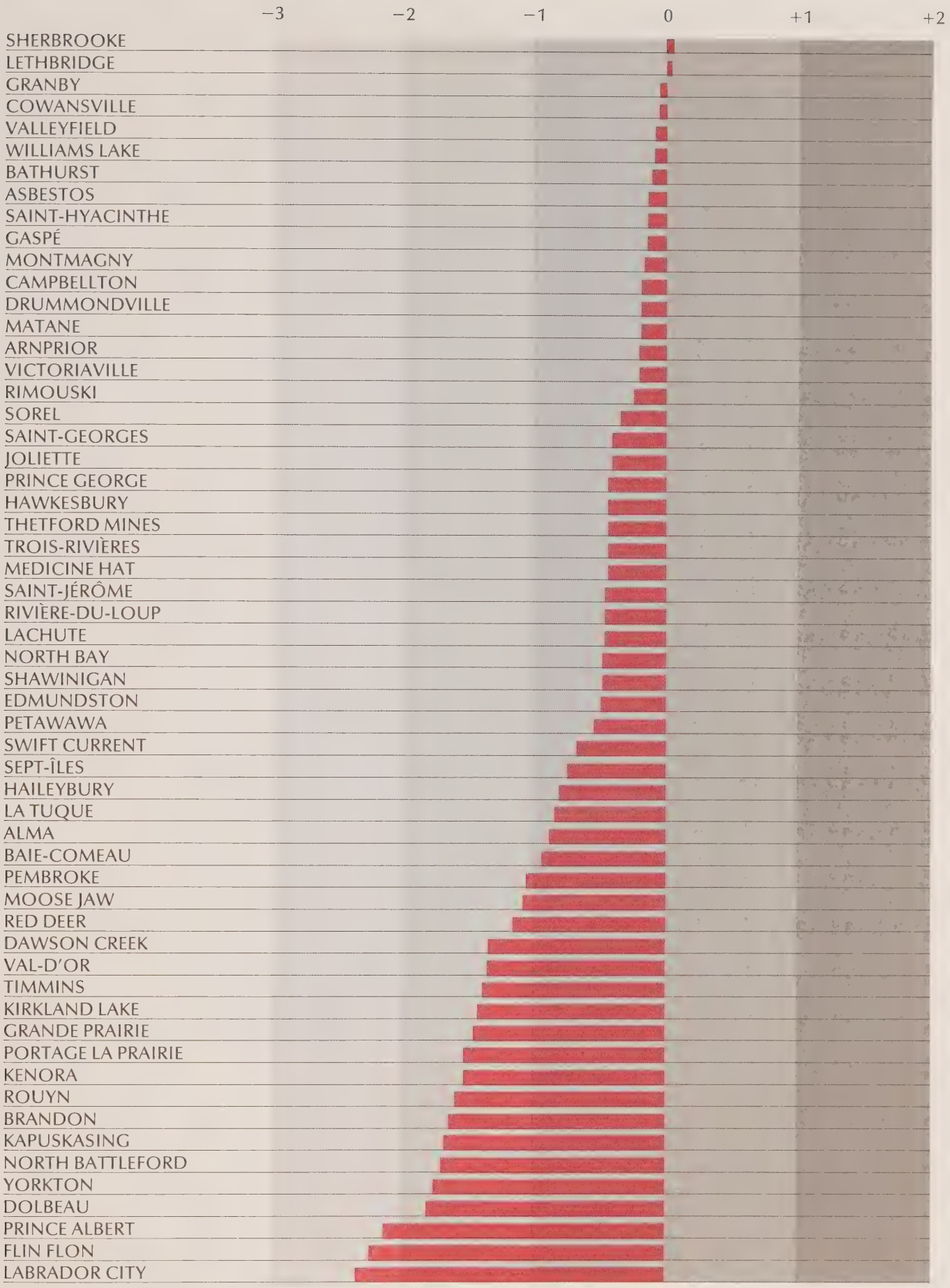
TABLE 11. JANUARY TEMPERATURE (°C) (MEAN 1941-70)

ATLANTIC REGION	Bathurst	−10.2	Moncton*	−8.0
	Campbellton*	−10.8	Newcastle*	−9.3
	Charlottetown*	−6.5	New Glasgow*	−5.5
	Corner Brook	−5.2	Oromocto	−8.8
	Edmundston	−12.5	Summerside*	−6.5
	Fredericton*	−9.2	Sydney*	−4.4
	Grand Falls*	−6.6	Sydney Mines*	−4.4
	Kentville*	−5.1	Truro*	−5.9
	Labrador City*	−21.9		
QUÉBEC REGION	Alma	−14.6	Rivière-du-Loup	−12.3
	Asbestos*	−10.4	Rouyn*	−17.9
	Baie-Comeau*	−14.9	Saint-Georges*	−11.6
	Cowansville	−9.9	Saint-Hyacinthe*	−10.5
	Dolbeau*	−20.5	Saint-Jean*	−8.8
	Drummondville*	−10.8	Saint-Jérôme*	−12.3
	Gaspé	−10.5	Sept-Îles	−13.9
	Granby*	−9.9	Shawinigan*	−12.3
	Joliette*	−11.6	Sherbrooke*	−9.6
	Lachute*	−12.3	Sorel*	−11.4
	La Tuque	−14.4	Thetford Mines*	−12.0
	Magog*	−9.5	Trois-Rivières*	−12.0
	Matane	−10.9	Val-d'Or*	−16.7
	Montmagny	−10.6	Valleyfield*	+10.1
	Rimouski*	−11.1	Victoriaville*	−11.0
ONTARIO REGION	Arnprior*	−10.9	Midland*	−8.8
	Barrie*	−8.8	North Bay	−12.2
	Belleville	−7.5	Orillia	−8.8
	Brantford*	−5.2	Oshawa*	−6.8
	Brockville	−8.3	Owen Sound	−5.8
	Chatham	−3.8	Pembroke*	−15.2
	Cobourg*	−7.2	Petawawa*	−12.8
	Cornwall	−9.2	Peterborough*	−8.5
	Guelph*	−6.8	Sarnia*	−4.7
	Haileybury*	−14.2	Sault Ste. Marie*	−9.4
	Hawkesbury*	−11.9	Simcoe	−5.2
	Kapuskasing	−18.3	Smiths Falls*	−8.3
	Kenora*	−17.7	Stratford	−6.7
	Kingston*	−7.0	Timmins*	−16.9
	Kirkland Lake	−17.1	Trenton*	−7.2
	Leamington	−4.0	Wallaceburg	−4.3
	Lincoln	−3.9	Woodstock	−6.1
	Lindsay	−8.8		
PRAIRIES REGION	Brandon	−18.2	Portage la Prairie	−17.7
	Flin Flon*	−21.7	Prince Albert	−21.0
	Grande Prairie	−17.2	Red Deer	−15.8
	Lethbridge	−9.7	Swift Current	−13.6
	Medicine Hat*	−12.1	Thompson	+
	Moose Jaw	−15.3	Yorkton	−19.0
	North Battleford*	−18.6		
BRITISH COLUMBIA REGION	Chilliwack*	1.5	Port Alberni*	0.6
	Courtenay*	3.1	Powell River	3.1
	Cranbrook	−8.8	Prince George*	−11.8
	Dawson Creek	−16.6	Prince Rupert*	1.8
	Kamloops*	−5.8	Terrace*	−5.0
	Kelowna*	−3.5	Trail*	−3.9
	Kitimat	−3.9	Vernon	−6.0
	Nanaimo*	2.6	Williams Lake*	−10.2
	Penticton	−2.9		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Atmospheric Environment Service, *Canadian Normals, Volume 1, Temperature 1941-70* (Downsview, Toronto: Environment Canada, 1973).

GRAPH 10. JANUARY TEMPERATURE (°C) (MEAN 1941-70)
(Z Scores)




−3
−2
−1
0
+1
+2
SHERBROOKE
LETHBRIDGE
GRANBY
COWANSVILLE
VALLEYFIELD
WILLIAMS LAKE
BATHURST
ASBESTOS
SAINT-HYACINTHE
GASPÉ
MONTMAGNY
CAMPBELLTON
DRUMMONDVILLE
MATANE
ARNPRIOR
VICTORIAVILLE
RIMOUSKI
SOREL
SAINT-GEORGES
JOLIETTE
PRINCE GEORGE
HAWKESBURY
THETFORD MINES
TROIS-RIVIÈRES
MEDICINE HAT
SAINT-JÉRÔME
RIVIÈRE-DU-LOUP
LACHUTE
NORTH BAY
SHAWINIGAN
EDMUNDSTON
PETAWAWA
SWIFT CURRENT
SEPT-ÎLES
HAILEYBURY
LA TUQUE
ALMA
BAIE-COMEAU
PEMBROKE
MOOSE JAW
RED DEER
DAWSON CREEK
VAL-D'OR
TIMMINS
KIRKLAND LAKE
GRANDE PRAIRIE
PORTAGE LA PRAIRIE
KENORA
ROUYN
BRANDON
KAPUSKASING
NORTH BATTLEFORD
YORKTON
DOLBEAU
PRINCE ALBERT
FLIN FLON
LABRADOR CITY

It can be readily seen that the range of economic activities performed by a city as well as its location with respect to other centres has significant consequences for the resident's quality of life.

The economic base of a city, be it mines or military installations, textile production or transportation facilities, retail sales or government administration, leaves its imprint on the community in many ways, from pollutants and property taxes to income and attitudes. Perhaps most obviously, the industrial structure of a place leaves its mark on the physical environment. In cities where retailing or public administration are the principal activities, the direct impact on the natural environment is minimal. But, in centres involved in resource processing and heavy manufacturing, residents and, especially, workers may have to suffer pungent fumes, high noise levels, unsightly piles of tailings and dust, not to mention the more harmful, invisible pollutants such as sulphur dioxide in the air or mercury in the water.

Less obvious, but probably more pervasive, is the effect that a town's industrial structure has on the occupational pursuits, employment rates, income levels and aspirations of the inhabitants. The types of industries located in a city directly affect its occupational profile — the number of miners and managers, sales persons and scientists, assembly line workers and others that are needed. As different occupational activities require different educational backgrounds, skill levels, degrees of experience and other personal characteristics, the occupational composition of a community tends to shape its social structure. The social structure of a community affects, in turn, the community facilities, services and amenities which the majority of residents perceive as important and are, therefore, willing and able to support.

On another front, the proportion of a city's firms which may be considered as "growth industries" or, conversely, "declining industries" affects its overall economic health, the job prospects of its workers and the psychological outlook of its residents. Industries which suffer from fluctuations or decline in market demand, and hence in production and employment, tend to cause an unstable situation which engenders feelings of insecurity among workers and their families. Moreover, for the town as a whole, this degree of impermanence in the economic base may adversely affect business investment, infrastructure improvements and facility provision.

Another aspect of industrial structure which helps to form the context for the quality of life experienced by the residents is the level of functional specialization in a community. On the positive side, industrial specialization serves to create the best possible standard of living for the residents of a community through the efficient allocation of capital and labour. On the minus side, a high level of specialization, which reaches its extreme in the one-industry resource town, narrows the range of employment opportunities (i.e., especially for women), leaves the town and its workers vulnerable to economic change and tends to lead to a similarity in social composition, lifestyle and outlook that verges on monotony.

No city is self-sufficient; each is interconnected with others in an urban system by flows of managers and labourers, money and goods, ideas and information. For individual residents, therefore, the proximity of medium-sized cities to metropolitan areas means greater access to a broader array of specialized sevices, retail outlets, cultural pursuits and top-flight entertainment than the market thresholds of the smaller city permit. For industries in medium-sized cities, proximity to metropolitan areas provides the benefits of access to a lucrative market, a well-developed transportation network and a rich source of business services. As the head-offices of large, multi-functional, multi-locational firms are primarily located in metropolitan centres, nearness to large centres may also enhance the prospects of a small city being selected as the site for a new production unit, given the limited search behaviour of most job-providing organizations.[24] The job opportunities thus created would presumably enhance the standard of living of a city's residents, thereby enlarging their prospects for a reasonable quality of life.

Proximity to a metropolitan area, however, may have drawbacks for the medium-sized centre. Direct competition with the metropolitan area may reduce the capacity of the smaller city to provide certain goods and services, thus forcing residents to travel longer distances to obtain what they require in the metropolis itself. The broad array of employment opportunities in the metropolis may also lure away the young, skilled members of a town's labour force, thereby reducing the potential of the smaller centre to maintain a dynamic, diversified industrial base. Moreover, the multiplier effects of local industrial expansion may be captured less by the smaller community and more by the metropolis which supplies inputs of machinery, financial arrangements and management expertise.

The economic and geographic context in which a city is situated has implications for the quality of life experienced by its residents. Consequently, measures of industrial structure and location within the urban system, as well as level of economic activity, are provided.

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[24]This form of industrial expansion may have several disadvantages for the smaller centre. First, the location of production units in smaller urban places leaves them dependent on the "outside" decisions of management centred in metropolitan areas. Secondly, units shifted to a smaller city are seldom the new "growth" units of large firms but rather the "mature" units that produce a standardized product by a routine process; hence, the development stimulus and diversity of employment opportunities provided are fairly small.
For a more detailed discussion of industrial expansion within an urban system, see:
J. Friedman, "The Spatial Organization of Power in the Development of Urban Systems", *Development and Change*, Vol. 4, No. 3, (1973);
A.R. Pred, *Major Job Providing Organizations and Systems of Cities* (Washington: Association of American Geographers, Commission on College Geography Resource Paper No. 27, 1974);
A.R. Pred, "Diffusion, Organizational Spatial Structure and City System Development", *Economic Geography*, Vol. 51, No. 3, (1975);
Wilbur R. Thompson, "The National System of Cities as an Object of Public Policy", *Urban Studies*, Vol. 9, No. 1, (1972).

INDUSTRIAL STRUCTURE: DOMINANT FUNCTION (1971)

ASPECT MEASURED	Consistent with the vast, regional variations in Canada's economic geography, Canadian cities perform diverse economic roles. Some are mining communities, others are transportation hubs, many focus on manufacturing, a few are centres of administration. In each case, the predominant industrial function of a community leaves an indelible mark on its social, environmental and economic character. The industrial structure of a centre directly influences the occupational profile, the labour force participation rates, the employment level, the income distribution as well as the predominant lifestyles and attitudes associated with the community's social structure. Also significant is the impact that the functional structure has on the fiscal base of the municipality and, thus, on the capability of local government to provide the desired range and level of public services and facilities. Finally, the physical environment of a centre may be despoiled by effluent, pollutants and waste materials from certain types of industry.	The identification of a city's dominant function, that is, the activity having the highest share of a city's total labour force, provides a simple, albeit crude, measure of industrial structure. The measure is based on census labour force data which refer to the labour market activity of the experienced labour force during the week prior to enumeration (i.e., 24 to 31 May 1971). The labour force information was subsequently classified by industry, according to the 1971 Standard Industrial Classification Manual. For presentation purposes, only the nine major urban-related, industrial classes were used. Given the preponderance of cities with manufacturing as their dominant function, it was considered necessary to subdivide manufacturing cities into two classes: Manufacturing I—cities in which the manufacturing activity is large in scale and highly specialized; and Manufacturing II—cities in which the manufacturing activity is smaller in scale, less specialized and usually oriented to local markets.
DIFFICULTIES OF INTERPRETATION	Although straightforward, the concept "dominant function" tends to obscure some of the more unique economic functions performed by Canadian cities (e.g., financial and business services) and thus provides a rather uniform picture of their industrial structure. To overcome this problem, the notion of a distinctive function may be employed, as is discussed under "Other Measures" below.	A useful industrial taxonomy must also avoid both the extremes of excessive aggregation and excessive disaggregation of industrial classes. To provide a picture of the overall economic context, the use of nine major functional categories seems appropriate as it avoids both the broad brushstrokes of the "primary-secondary-tertiary" schema and the minute detail of minor industrial categories such as "tobacco", "food and beverage" or "leather and tanning".

The proportion of the labour force employed in the various economic activities differs sharply from one city to another, reflecting the comparative advantages of the regional economy and the role that each city plays within Canada's urban system. Manufacturing specialization apparently exists for centres in the central Canadian heartland, the Great Lakes–St. Lawrence lowlands, while cities in the far-flung hinterland must devote more of their labour force to transportation and wholesale/retail distribution in order to overcome the considerable distances between thinly spread populations involved in primary activities.

Mining is the raison d'être of communities located along the edge of the Canadian Shield in northern Manitoba, Ontario and Quebec (e.g., Thompson, Timmins and Val-d'Or). Finally, in some cases, government has helped lay the economic foundation of a city, as in the decision to locate military installations in Oromocto, Petawawa, Trenton and Chilliwack.

Heartland-hinterland differences in economic activities performed are quite distinct. Of the 48 medium-sized cities situated in the Windsor-Québec City Axis, fully 39 are predominantly involved in manufacturing. By comparison, only 19 of the 64 medium-sized cities in the hinterland have manufacturing as a dominant function. But, the distinction between the two regions does not end there. Manufacturing cities of the heartland, it has been suggested, form basic units in fully integrated manufacturing regions where interaction among cities is significant.[25] High degrees of industrial linkage have developed between cities, and all types of manufacturing take place, from metal fabrication to electronics production and textile manufacturing. In contrast, hinterland cities which specialize in manufacturing are relatively few in number and isolated in location; they generally stand apart from surrounding cities since they do not focus primarily on servicing nearby rural areas. Extremely specialized, these communities are characterized by a few, large industrial establishments involved in resource processing, such as ore smelting in Kitimat and Trail, and pulp and paper mills in Grand Falls and Port Alberni. However, in the vast majority of Maritime and Western cities, manufacturing is subsidiary to transportation and wholesaling functions.

[25] J.W. Maxwell, *The Functional Structure of Canadian Cities: A Classification of Cities* (Ottawa: Ministry of State for Urban Affairs, discussion paper, 1973).

OTHER MEASURES

A number of approaches to classifying the industrial structure of the city on the basis of labour force data have been attempted. Some have met with more success than others.

A more complete picture of a city's industrial structure can be obtained by determining its distinctive functions. When identifying a city's distinctive functions, activities are rated in terms of their relative importance in a city's functional profile compared to their relative importance in the average functional profile of all cities studied. In this way, cities which have relatively greater numbers of workers in proportionately small employment categories (e.g., Finance, Transportation), are identifiable. Less information is eliminated, but classification becomes problematic since a city may have many distinctive functions.

A totally different approach to functional classification taken by Smith and by Marshall is to measure each city's degree of similarity to every other city in terms of the full array of industrial functions.[26] To do so, a large correlation matrix is derived which is then reduced by means of a grouping algorithm. By such means, cities are assigned to groups in which they have an industrial structure more similar to some other member of their own group than to any city outside the group. Several comprehensive reviews of methods for classifying a city's industrial structure are available.[27]

An extension of the analysis of a city's functional structure is the determination of its degree of industrial specialization. Whether the work force of a town is largely comprised of labourers at one pulp and paper mill or spread more evenly among retail establishments, trucking firms, business services and many small manufacturers has significant consequences for the occupational profile, the social composition and the vulnerability of the town to economic change. In general terms, an index of industrial specialization represents a comparison of the functional structure of an individual city with an "average" or "normal" functional profile, which is considered to be the diversified structure for the complete set of cities under study. The basic data required to calculate the index is the proportion of the labour force in the various industrial functions for each city.

Finally, a city's industrial structure may be studied from many perspectives that do not involve the use of labour force data. Some of these include the number and size of establishments, value added per worker and the location of head office units.

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[26]R.H. T. Smith, "Method and Purpose in Functional Town Classification", *Annals of the Association of American Geographers,* Vol. 55 (1965), pp. 539-548; J.U. Marshall, "City Size, Economic Diversity and Functional Type: The Canadian Case", *Economic Geography,* Vol. 51, No. 1, (January 1975), pp. 37-49.

[27]Smith, *op. cit.*, 1965; B.J.L. Berry and K.E. Smith (eds.), *City Classification Handbook: Methods and Applications* (New York: Wiley, 1972).

TABLE 12. INDUSTRIAL STRUCTURE: DOMINANT FUNCTION (1971)⊕

ATLANTIC REGION	Bathurst	Extraction	Moncton*	Transp Stor & Comm
	Campbellton*	Community Service	Newcastle*	Pub Adm & Def
	Charlottetown*	Community Service	New Glasgow*	Manufacturing II
	Corner Brook	Transp Stor & Comm†	Oromocto	Pub Adm & Def
	Edmundston	Manufacturing II	Summerside*	Pub Adm & Def
	Fredericton*	Pub Adm & Def	Sydney*	Extraction
	Grand Falls*	Manufacturing II	Sydney Mines*	Transp Stor & Comm
	Kentville*	Retail Trade	Truro*	Manufacturing II
	Labrador City*	Extraction		
QUÉBEC REGION	Alma	Manufacturing II	Rivière-du-Loup	Community Service
	*Asbestos**	Extraction	Rouyn*	Extraction
	Baie-Comeau*	Manufacturing II	*Saint-Georges**	Pub Adm & Def
	Cowansville	Manufacturing I	*Saint-Hyacinthe**	Manufacturing II
	Dolbeau*	Manufacturing II	*Saint-Jean**	Manufacturing II
	*Drummondville**	Manufacturing I	*Saint-Jérôme**	Manufacturing II
	Gaspé	Community Service	Sept-Îles	Extraction
	*Granby**	Manufacturing I	*Shawinigan**	Manufacturing I
	*Joliette**	Manufacturing II	*Sherbrooke**	Community Service
	*Lachute**	Manufacturing I	*Sorel**	Manufacturing I
	La Tuque	Manufacturing I	*Thetford Mines**	Extraction
	*Magog**	Manufacturing I	*Trois-Rivières**	Manufacturing II
	Matane	Community Service	Val-d'Or*	Extraction
	Montmagny	Manufacturing II	*Valleyfield**	Manufacturing I
	Rimouski*	Community Service	*Victoriaville**	Manufacturing I
ONTARIO REGION	*Arnprior**	Manufacturing I	*Midland**	Manufacturing I
	*Barrie**	Manufacturing II	North Bay	Pub Adm & Def
	*Belleville**	Manufacturing II	*Orillia*	Manufacturing II
	*Brantford**	Manufacturing I	*Oshawa**	Manufacturing I
	Brockville	Manufacturing I	*Owen Sound*	Manufacturing II
	Chatham	Manufacturing II	*Pembroke**	Pub Adm & Def
	*Cobourg**	Manufacturing I	*Petawawa**	Pub Adm & Def
	Cornwall	Manufacturing II	*Peterborough**	Manufacturing II
	*Guelph**	Manufacturing II	*Sarnia**	Manufacturing II
	Haileybury*	Extraction	Sault Ste. Marie*	Manufacturing I
	*Hawkesbury**	Manufacturing I	*Simcoe*	Manufacturing II
	Kapuskasing	Manufacturing I	*Smiths Falls**	Community Service
	Kenora*	Manufacturing II	*Stratford*	Manufacturing I
	*Kingston**	Community Service	Timmins*	Extraction
	Kirkland Lake	Extraction	*Trenton**	Pub Adm & Def
	Leamington	Manufacturing I	*Wallaceburg**	Manufacturing I
	Lincoln	Manufacturing II	*Woodstock*	Manufacturing I
	Lindsay	Manufacturing II		
PRAIRIES REGION	Brandon	Community Service	Portage la Prairie	Community Service
	Flin Flon*	Extraction	Prince Albert	Community Service
	Grande Prairie	Retail Trade	Red Deer	Pub Adm & Def
	Lethbridge	Retail Trade	Swift Current	Retail Trade
	Medicine Hat*	Manufacturing II	Thompson	Extraction
	Moose Jaw	Transp Stor & Comm	Yorkton	Community Service
	North Battleford*	Community Service		
BRITISH COLUMBIA REGION	Chilliwack*	Pub Adm & Def	Port Alberni*	Manufacturing I
	Courtenay*	Pub Adm & Def	Powell River	Manufacturing I
	Cranbrook	Transp Stor & Comm	Prince George*	Manufacturing II
	Dawson Creek	Transp Stor & Comm	Prince Rupert*	Manufacturing II
	Kamloops*	Construction	Terrace*	Transp Stor & Comm
	Kelowna*	Construction	Trail*	Manufacturing I
	Kitimat	Manufacturing I	Vernon	Retail Trade
	Nanaimo*	Manufacturing II	Williams Lake*	Manufacturing II
	Penticton	Personal Service		

NOTES: 1971 boundaries are used for all urban areas.
⊕Heartland centres are in italics.
Hinterland centres are not in italics.
†Transportation Storage and Communication.
⊖Public Administration and Defence.
SOURCE: Derived from: Statistics Canada, 1971 Census User Summary Tape, (Ottawa: Statistics Canada, 1975). Available in D.M. Ray (ed.), *Canadian Urban Trends: National Perspective, Volume One*. (Toronto and Ottawa: Copp Clark and the Ministry of State for Urban Affairs, 1976).

LOCATION IN URBAN SYSTEM: DISTANCE TO NEAREST CENSUS METROPOLITAN AREA

A city does not stand alone; it is part of an urban system linked to other cities by flows of commuters, shoppers, goods and services. Moreover, the economics of smaller cities are intertwined with those of the metropolitan centres within the regional urban system through the exchange of commodities, the flow of information, the diffusion of innovations and the dissemination of policy directives from public and private decision makers.

From the perspective of individual residents, flows of consumer products and services between cities tend to decline in direct proportion to the distance between them. Consequently, the residents of cities located far from metropolitan centres, such as frontier resource towns, are largely deprived of high-order shopping, entertainment, educational and recreational facilities. Conversely, people in communities located in proximity to large metropolitan centres generally have access to the full gamut of social, cultural and recreational amenities and services offered by the metropolis.

From a broader economic standpoint, location in proximity to the regionally dominant metropolitan centre, which is the home of corporate head offices, major financial institutions, business consulting services and high-powered research and educational establishments, can influence the economic health of smaller urban centres in many and diverse ways. Some of these include the provision of financial arrangements and management expertise, the introduction of new production processes, and investment by head-office units in the establishment or expansion of production units. Needless to say, such business transactions have implications for the number and type of employment opportunities available and, thus, in broad terms, affect the quality of life experienced by a city's residents.

As an indication of the frequency and intensity of interaction with the metropolitan area, the straight-line distance from each medium-sized centre to the closest census metropolitan area is reported.

There are two different spatial sub-systems of cities in Canada. The one runs east to west across the nation at an evenly spaced, but relatively low, density of one metropolitan centre every 160 to 500 kilometres. The other, stretching in a line from Windsor to Québec City, has a fundamentally different linkage pattern and operates at a density about ten times higher than the first sub-system.

The contrast in linkages between the urban sub-systems of the heartland and hinterland is set in sharp relief by reference to the distances between nearby centres. Within the Windsor-Québec City Axis, all cities of 10 000 and over lie within 180 kilometres, approximately two-hours' driving time, of a metropolitan area. In the remainder of the country, medium-sized cities are strung out thinly, with only one-third being situated within 180 kilometres of a metropolitan centre.

Within the hinterland, pockets of significant isolation from the facilities and services of a metropolitan area are evident. Discontinuities in the settlement pattern of B.C., where resource processing centres are situated in the interior valleys or north along the Pacific coastline, mean that distances to Vancouver, Victoria or Edmonton are great and the levels of interaction therefore relatively low for centres such as Prince George, Prince Rupert, Kitimat, Terrace and Dawson Creek. Residents of mining communities that dot the Canadian Shield are also among those that most keenly feel the isolation from the advantages of metropolitan life (e.g., Labrador City, Flin Flon and Thompson). Another cluster of communities located far from the influence of metropolitan areas comprises cities in the Gaspé and northern New Brunswick (e.g., Bathurst, Campbellton, Matane and Gaspé). Other centres situated at significant distances from metropolitan areas and which, consequently, must provide a broad spectrum of services on their own are the "island communities" (e.g., Corner Brook, Charlottetown, Summerside and Sydney).

OTHER MEASURES

As a measure of access, or lack thereof, to the facilities and services of a metropolitan area, straight-line distance is somewhat crude and subsumes many other geographic, economic and social factors. Although on a national basis data are limited, possible refinements to the straight-line distance measure include actual road distance between centres, estimated travel time and estimated travel cost according to various transportation modes.

A more direct way of ascertaining the degree of interaction between medium-sized centres and their respective metropolitan areas is to measure the volume and direction of flows of people, goods and communications. Various measures of movements between origin and destination cities have been used to delineate the hierarchy of cities within Canada's regional urban systems. These include mail flows,[28] business telephone calls,[29] rail freight movement,[30] automobile traffic,[31] and airline passenger flows.[32]

But, the potential for utilizing flows data to determine the strength and patterns of spatial linkages among cities is quite limited. A single flow measure cannot by itself describe the type and volume of interaction occuring among cities. Each type of interconnection has its own particular attributes, varying by mode, by the nature of commodity moved, and so forth. Moreover, there are very few compilations of origin-destination measures. Most of those which are available differ according to geographic unit (i.e., city, county, province, telephone exchange district, postal zone) and have been collected for varying time spans in different years, making them not comparable.

[28]L.H. Russwurm, *Development of an Urban Corridor System: Toronto to Stratford Area 1941-1966* (Toronto: Regional Development Branch, Dept. of Treasury, Economics and Intergovernmental Affairs, Province of Ontario, 1970).

[29]J.W. Simmons, *Patterns of Interaction Within Ontario and Quebec,* Research Paper No. 41 (Toronto: University of Toronto, Centre for Urban and Community Studies, 1970).

[30]*Ibid.*

[31]J.H. Chung and M. Meunier, "Urban System and Regional Growth in Canada: Some Preliminary Findings", Economic Council of Canada (first draft mimeographed, 1975).

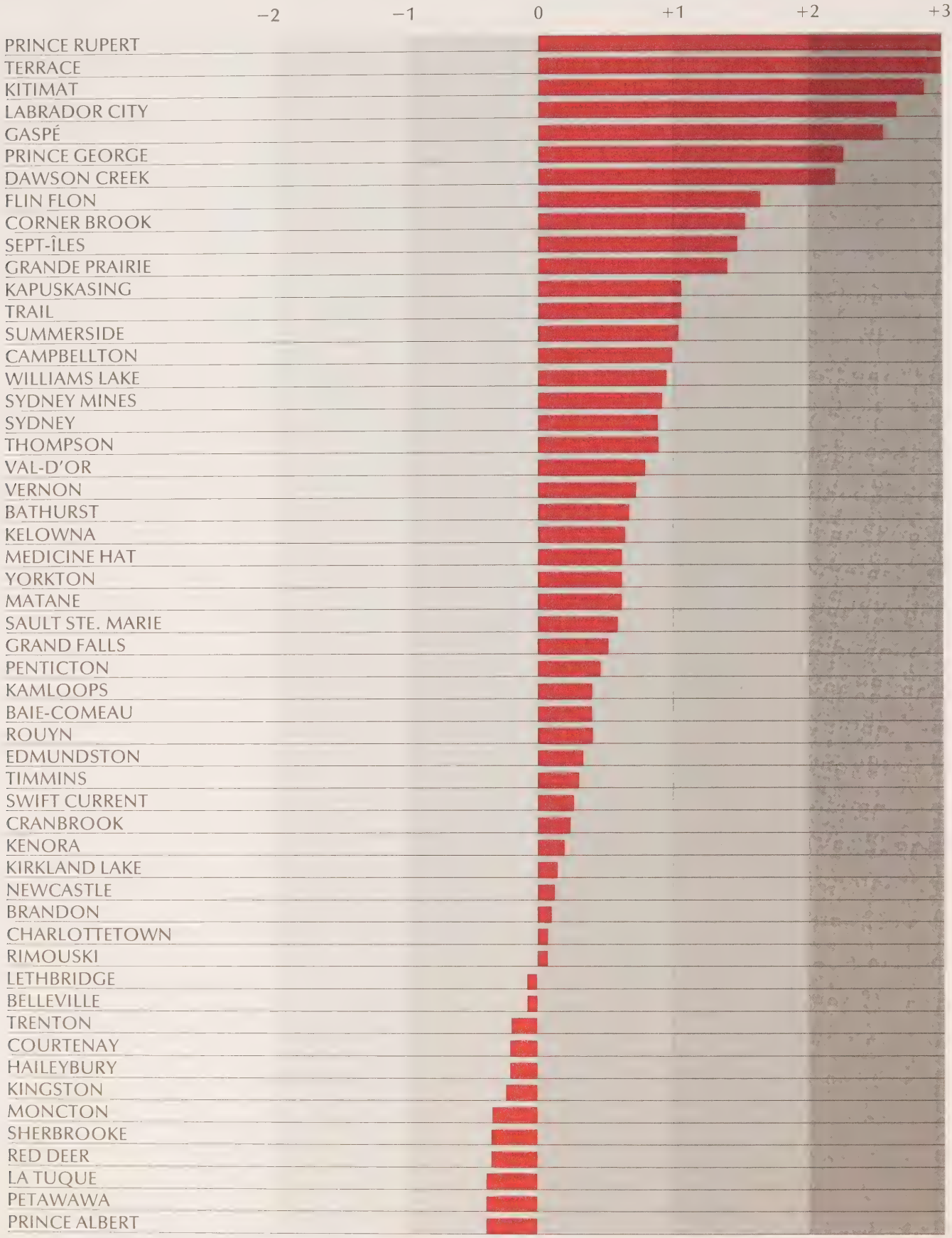
[32]R. Muncaster, "The Contemporary Canadian System of Cities", prepared for the Urbanization Theme, Canada Studies Foundation, Canadian Association of Geographers, mimeographed, 1975.

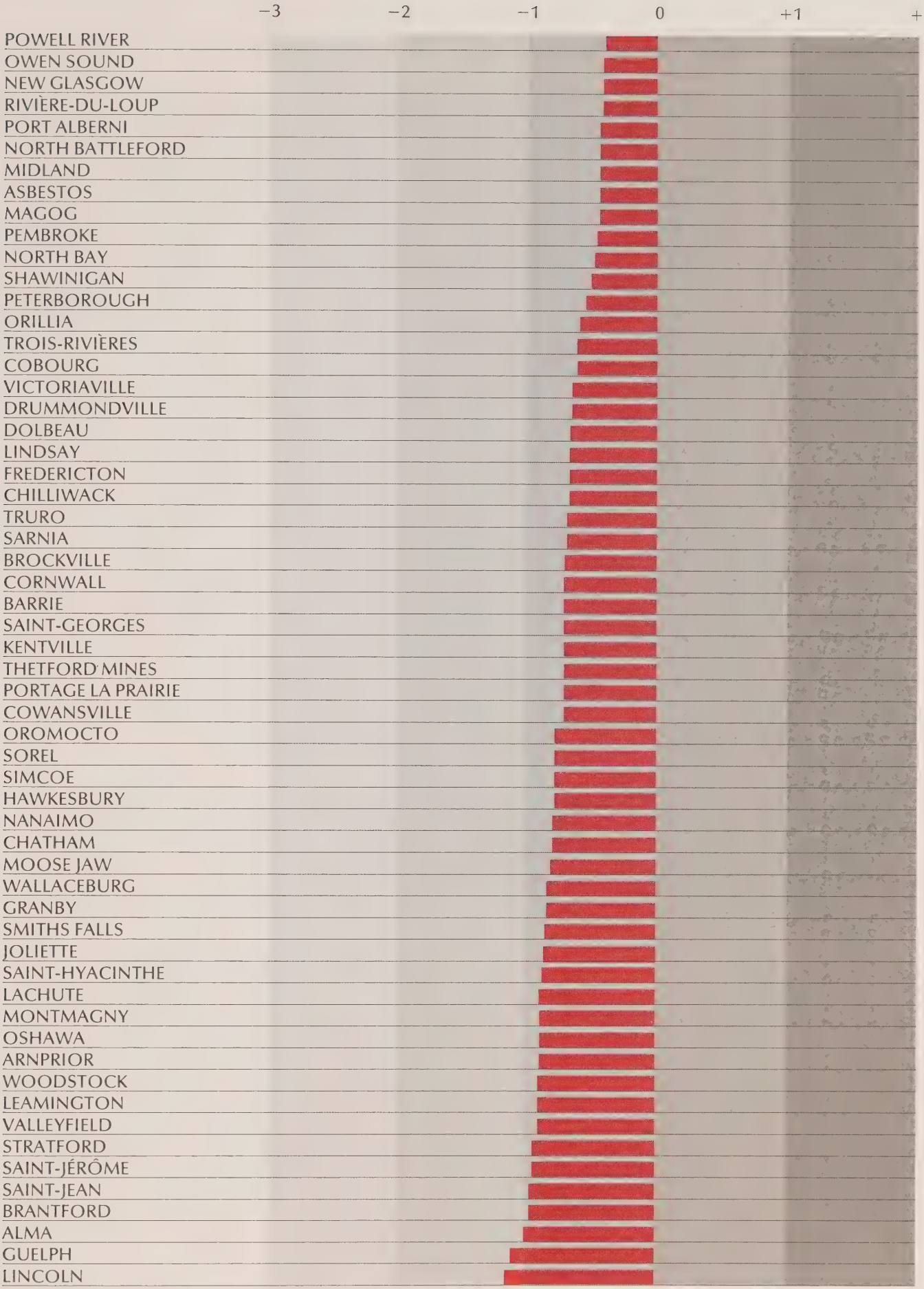
TABLE 13. LOCATION IN URBAN SYSTEM: DISTANCE TO NEAREST CMA (KILOMETRES)⊕

ATLANTIC REGION	Bathurst	280	Moncton*	139
	Campbellton*	332	Newcastle*	200
	Charlottetown*	188	New Glasgow*	131
	Corner Brook	412	Oromocto	72
	Edmundston	224	Summerside*	336
	Fredericton*	94	Sydney*	310
	Grand Falls*	257	Sydney Mines*	316
	Kentville*	86	Truro*	92
	Labrador City*	596		
QUÉBEC REGION	Alma	32	Rivière-du-Loup	131
	*Asbestos**	126	Rouyn*	238
	Baie-Comeau*	238	*Saint-Georges**	86
	Cowansville	76	*Saint-Hyacinthe**	56
	Dolbeau*	96	*Saint-Jean**	40
	*Drummondville**	97	*Saint-Jérôme**	41
	Gaspé	566	Sept-Îles	409
	*Granby**	64	*Shawinigan**	118
	*Joliette**	57	*Sherbrooke**	137
	*Lachute**	54	*Sorel**	72
	La Tuque	136	*Thetford Mines**	80
	*Magog**	123	*Trois-Rivières**	107
	Matane	260	Val-d'Or*	297
	Montmagny	52	*Valleyfield**	46
	Rimouski*	185	*Victoriaville**	99
ONTARIO REGION	*Arnprior**	52	*Midland**	128
	*Barrie**	86	North Bay	120
	Belleville	171	*Orillia*	107
	*Brantford**	35	*Oshawa**	52
	Brockville	91	*Owen Sound*	131
	Chatham	68	*Pembroke**	120
	*Cobourg**	105	*Petawawa**	134
	Cornwall	88	*Peterborough**	113
	*Guelph**	22	*Sarnia**	92
	Haileybury*	148	Sault Ste. Marie*	260
	*Hawkesbury**	70	*Simcoe*	72
	Kapuskasing	342	*Smiths Falls**	60
	Kenora*	204	*Stratford*	41
	*Kingston**	145	Timmins*	224
	Kirkland Lake	201	*Trenton**	155
	Leamington	46	*Wallaceburg*	64
	Lincoln	14	*Woodstock*	48
	Lindsay	96		
PRAIRIES REGION	Brandon	198	Portage la Prairie	80
	Flin Flon*	427	Prince Albert	132
	Grande Prairie	382	Red Deer	137
	Lethbridge	174	Swift Current	219
	Medicine Hat*	260	Thompson	305
	Moose Jaw	65	Yorkton	260
	North Battleford*	128		
BRITISH COLUMBIA REGION	Chilliwack*	94	Port Alberni*	129
	Courtenay*	150	Powell River	132
	Cranbrook	212	Prince George*	524
	Dawson Creek	512	Prince Rupert*	760
	Kamloops*	249	Terrace*	712
	Kelowna*	267	Trail*	340
	Kitimat	662	Vernon	294
	Nanaimo*	70	Williams Lake*	328
	Penticton	252		

NOTES: 1971 boundaries are used for all urban areas.
⊗Heartland centres are in italics.
Hinterland centres are not in italics.
SOURCE: Measurements computed by Frank Graves and Tony Sroka, at the Ministry of State for Urban Affairs. 1977.

GRAPH 11. LOCATION IN URBAN SYSTEM: DISTANCE TO NEAREST CMA (KILOMETRES)
(Z Scores)




−3
−2
−1
0
+1
+2
POWELL RIVER
OWEN SOUND
NEW GLASGOW
RIVIÈRE-DU-LOUP
PORT ALBERNI
NORTH BATTLEFORD
MIDLAND
ASBESTOS
MAGOG
PEMBROKE
NORTH BAY
SHAWINIGAN
PETERBOROUGH
ORILLIA
TROIS-RIVIÈRES
COBOURG
VICTORIAVILLE
DRUMMONDVILLE
DOLBEAU
LINDSAY
FREDERICTON
CHILLIWACK
TRURO
SARNIA
BROCKVILLE
CORNWALL
BARRIE
SAINT-GEORGES
KENTVILLE
THETFORD MINES
PORTAGE LA PRAIRIE
COWANSVILLE
OROMOCTO
SOREL
SIMCOE
HAWKESBURY
NANAIMO
CHATHAM
MOOSE JAW
WALLACEBURG
GRANBY
SMITHS FALLS
JOLIETTE
SAINT-HYACINTHE
LACHUTE
MONTMAGNY
OSHAWA
ARNPRIOR
WOODSTOCK
LEAMINGTON
VALLEYFIELD
STRATFORD
SAINT-JÉRÔME
SAINT-JEAN
BRANTFORD
ALMA
GUELPH
LINCOLN

ASPECT MEASURED

The value of building permits issued in a municipality provides an indication of the degree of expansion and renewal of capital stock occuring in the community, including residential, industrial, commercial, institutional and government construction. The extent of building activity that takes place in a centre has different implications for different groups of people. For the individual citizen as a resident and user of services, new construction and improvements within the city imply greater choice in terms of available housing stock, stores and public facilities. For the business community and ordinary citizen alike, increased construction activity is generally a sign of investor confidence in the economic prospects of the city, thereby enhancing the overall economic climate. Moreover, building activity in the form of homes, offices, roads and utilities may serve to attract new industrial enterprise to the city, both directly, by the provision of infrastructure needed by industry, and, indirectly, by the provision of homes and creation of an attractive living environment for the management and labourers of firms. For local governments, increased construction activity can prove to be a two-edged sword. On the one hand, benefits are derived from the enlarged tax assessment and, thus, the potential increase in revenues; on the other hand, the new structures also serve to increase municipal expenditures for sewerage, utilities, roads, police and fire protection. Hence, the fiscal balance of municipalities could be affected, for better or worse, by the expansion of the city's built environment.

An extremely low level of construction activity may simply represent a temporary adjustment, perhaps due to a previous period of overbuilding. But, a prolonged period of construction inactivity may represent deepseated structural problems in the local economy. Nor are extremely high levels of building activity necessarily indicative of a reasonable quality of life. In the short run, excessive construction activity may, for example, indicate an unmet demand for accommodation with its attendant consequences of high prices, crowding and congestion.

The measure, average value of building permits issued per capita, encompasses new construction as well as alterations and improvements to existing structures. The data are supplied by the issuing municipalities, then compiled and published by Statistics Canada on a monthly basis. The four principal categories of structures covered under this measure are:

Residential: all dwelling types, including improvements such as garages, pools;
Industrial: manufacturing, transportation, communications facilities; other utilities;
Commercial: stores, warehouses, offices, theatres;
Institutional: schools, hospitals, clinics, churches, government administration buildings;

Since not all municipalities issue permits for engineering works, the value of building permits issued for engineering construction projects is excluded from this measure. Also omitted is the estimated value of minor repair and restoration work such as painting and roofing.

In order to reflect the medium-term situation in a community and remove the obvious extremes caused by the construction of a major building in a particular year, a three-year average was calculated for the value of building permits issued. The dollar amount was standardized on a per capita basis to eliminate differences arising from variations in community size. As data were not always available for all component municipalities, or parts thereof, in a census agglomeration, the population was, where necessary, adjusted accordingly before the per capita figures were calculated.

DIFFICULTIES OF INTERPRETATION	Strict comparisons between cities are not possible as variations exist in the value of permits issued according to the provisions of municipal building bylaws, in the methods of estimating the values of construction and the diligence with which the terms of the bylaw are applied. In addition, information is not available on the value of permits allowed to lapse without the work for which the permit was issued being completed.	
URBAN PATTERN	On a national basis, there is extreme variation in the level of building activity occurring in cities. The dollar value ranges from a low of $83 per person in Kentville to a high of $2117 per person in Medicine Hat. Regionally, a clear demarcation exists between the volume of construction taking place in the East and the West. In Maritime, Québec and Ontario communities, the value of permits issued averaged slightly over $400 per person during the three-year period. But, in Prairie and B.C. centres, the volume of building projects was nearly twice as high, averaging close to $800 per person. But the averages mask considerable variation among centres within the Western region, especially in the Prairie provinces, as evidenced by the high standard deviation. The most consistent level of building activity across a region occurred among Ontario communities.	The robustness of Alberta's economy is apparent from the high-value building permits issued in the province's cities (e.g., Medicine Hat, Red Deer, Lethbridge and Grande Prairie). Though less consistent across the province, large volumes of construction were also recorded in some B.C. centres, notably Prince Rupert, Prince George, Nanaimo, Courtenay, Vernon and Penticton. Higher than average levels of building activity were also experienced in all medium-sized Saskatchewan centres. Conversely, some of the "old" resource extraction and primary processing centres, whose local economies have been stricken by obsolescent production technology as well as dwindling markets, have correspondingly low levels of construction activity (e.g., Flin Flon and Haileybury, Bathurst and Edmundston, New Glasgow, Sydney and Grand Falls). Similarly, low levels of construction have occurred in communities that service economically peripheral regions (e.g., Gaspé).

a) Overall aggregate values

Value of building permits
Average value
per person per year ($)

Mean ($\bar{X}$)	542.70
Standard deviation (S)	294.70
Maximum	2,117.00
Minimum	83.00

b) By region

	$\bar{X}$	S	N
Atlantic	442.80	272.80	14
Québec	421.60	183.30	30
Ontario	473.30	136.50	35
Prairies	880.30	481.80	12
British Columbia	743.50	291.80	17

OTHER MEASURES

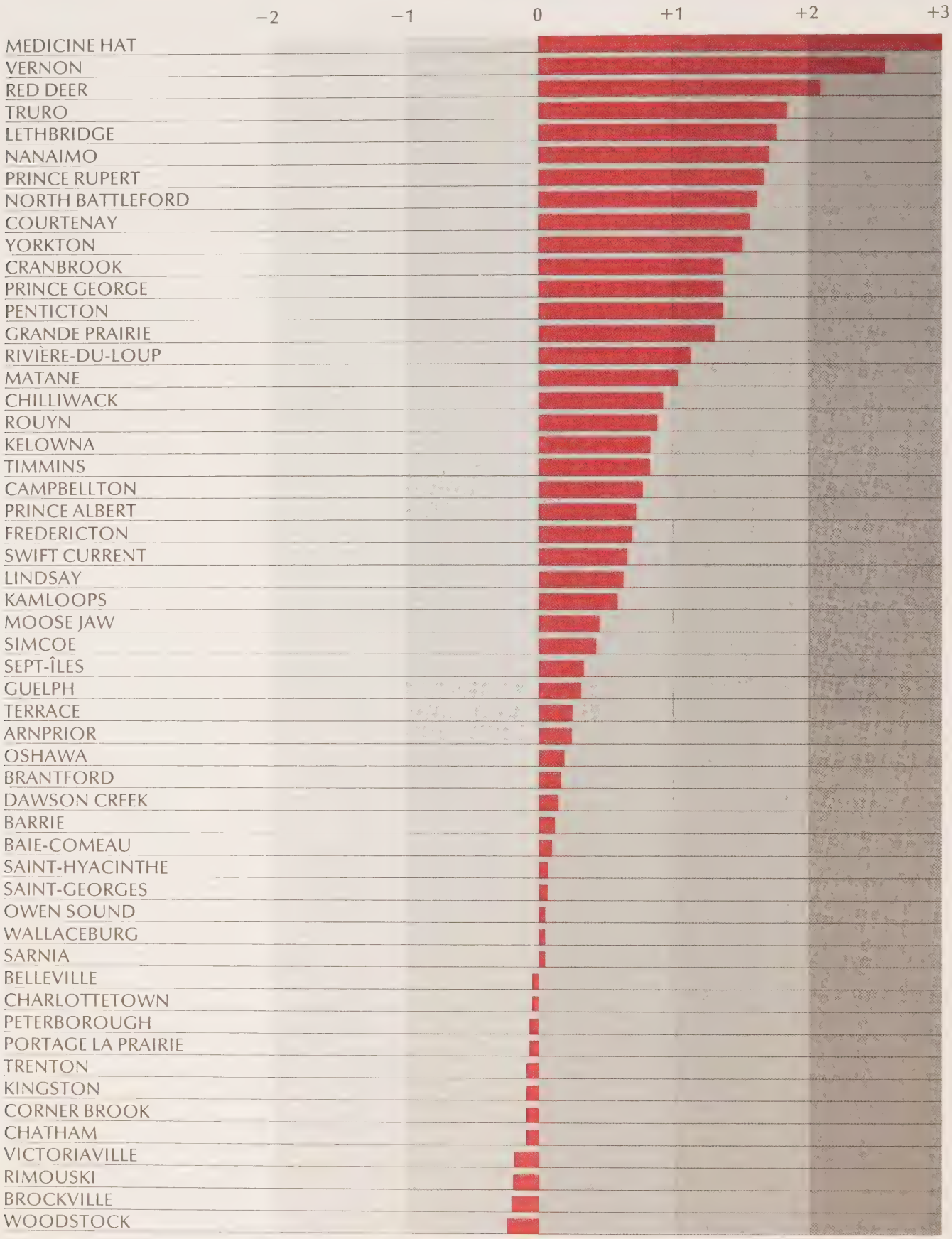
To the extent that the volume and value of local building activity is representative of the physical, the economic and the population base of the community, possible surrogate measures include the number of subdivisions and severances approved, the rate of change in the tax assessment base of the municipality, the number of new businesses established in the city, the rate of change in the city's labour force and the five-year rate of population change. Although these measures also suffer from particular shortcomings in terms of conceptual validity, measurement reliability and data availability, each touches on different aspects of a community's level of economic well-being.

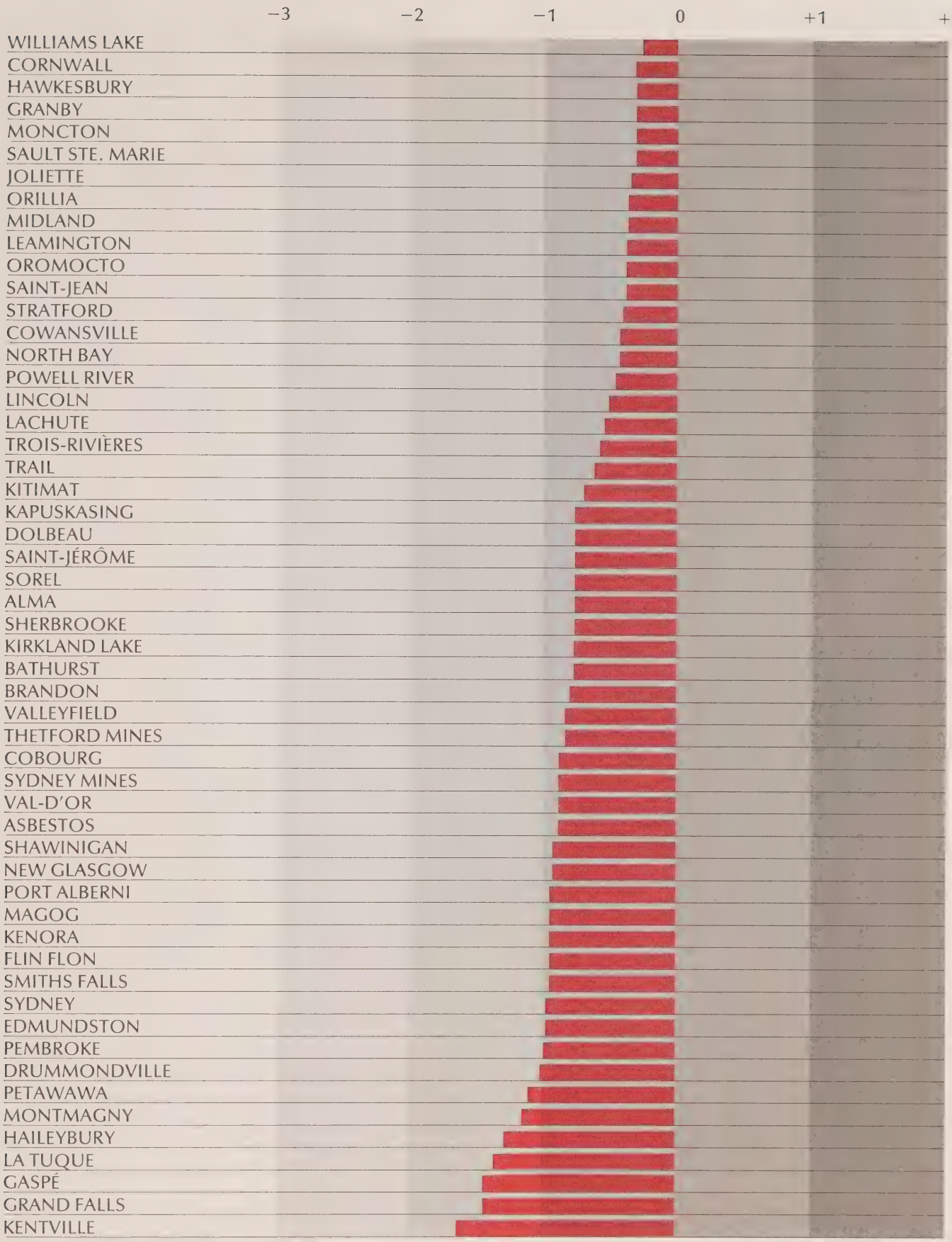
TABLE 14. VALUE OF BUILDING PERMITS: AVERAGE VALUE PER PERSON PER YEAR (1974-76) ($)

ATLANTIC REGION	Bathurst	329	Moncton[b]	464
	Campbellton[a]	762	Newcastle*	+
	Charlottetown[a]	532	New Glasgow*	293
	Corner Brook	518	Oromocto	422
	Edmundston	266	Summerside*	+
	Fredericton[b]	743	Sydney[a]	271
	Grand Falls[a]	121	Sydney Mines[a]	309
	Kentville*	83	Truro*	1086
	Labrador City*	+		
QUÉBEC REGION	Alma	341	Rivière-du-Loup	852
	Asbestos*	299	Rouyn*	810
	Baie-Comeau*	569	Saint-Georges*	555
	Cowansville	411	Saint-Hyacinthe[a]	557
	Dolbeau*	361	Saint-Jean*	422
	Drummondville[a]	248	Saint-Jérôme*	360
	Gaspé	130	Sept-Îles	627
	Granby*	464	Shawinigan[a]	294
	Joliette*	448	Sherbrooke*	333
	Lachute*	398	Sorel*	357
	La Tuque	133	Thetford Mines[a]	316
	Magog[a]	284	Trois-Rivières*	390
	Matane	839	Val-d'Or[a]	307
	Montmagny	229	Valleyfield[a]	316
	Rimouski*	491	Victoriaville*	508
ONTARIO REGION	Arnprior*	615	Midland*	436
	Barrie*	574	North Bay	409
	Belleville	538	Orillia	439
	Brantford*	581	Oshawa[a]	589
	Brockville	483	Owen Sound	553
	Chatham	516	Pembroke*	249
	Cobourg*	312	Petawawa*	238
	Cornwall	464	Peterborough*	530
	Guelph[a]	622	Sarnia[a]	545
	Haileybury*	204	Sault Ste. Marie*	458
	Hawkesbury[a]	464	Simcoe	673
	Kapuskasing	362	Smiths Falls*	279
	Kenora*	281	Stratford	418
	Kingston*	520	Timmins[b]	799
	Kirkland Lake	333	Trenton*	527
	Leamington	433	Wallaceburg	550
	Lincoln	401	Woodstock	471
	Lindsay	698		
PRAIRIES REGION	Brandon	322	Portage la Prairie	529
	Flin Flon*	280	Prince Albert	755
	Grande Prairie	913	Red Deer	1154
	Lethbridge	1072	Swift Current	721
	Medicine Hat*	2117	Thompson	+
	Moose Jaw	679	Yorkton	998
	North Battleford*	1024		
BRITISH COLUMBIA REGION	Chilliwack*	822	Port Alberni[a]	289
	Courtenay[a]	1021	Powell River	409
	Cranbrook	943	Prince George[b]	941
	Dawson Creek	575	Prince Rupert[a]	1030
	Kamloops[b]	697	Terrace[a]	617
	Kelowna[b]	804	Trail*	384
	Kitimat	381	Vernon	1284
	Nanaimo[b]	1032	Williams Lake*	470
	Penticton	940		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipalities within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the enlarged municipality as of 1974.
[c]Average value based on 1975 and 1976 data only.
SOURCE: Statistics Canada, *Building Permits*, Cat. 64-203 (Ottawa: 1974-76), Annual.

GRAPH 12. VALUE OF BUILDING PERMITS: AVERAGE VALUE PER PERSON PER YEAR (1974-76) ($)
(Z Scores)




−3
−2
−1
0
+1
+2
WILLIAMS LAKE
CORNWALL
HAWKESBURY
GRANBY
MONCTON
SAULT STE. MARIE
JOLIETTE
ORILLIA
MIDLAND
LEAMINGTON
OROMOCTO
SAINT-JEAN
STRATFORD
COWANSVILLE
NORTH BAY
POWELL RIVER
LINCOLN
LACHUTE
TROIS-RIVIÈRES
TRAIL
KITIMAT
KAPUSKASING
DOLBEAU
SAINT-JÉRÔME
SOREL
ALMA
SHERBROOKE
KIRKLAND LAKE
BATHURST
BRANDON
VALLEYFIELD
THETFORD MINES
COBOURG
SYDNEY MINES
VAL-D'OR
ASBESTOS
SHAWINIGAN
NEW GLASGOW
PORT ALBERNI
MAGOG
KENORA
FLIN FLON
SMITHS FALLS
SYDNEY
EDMUNDSTON
PEMBROKE
DRUMMONDVILLE
PETAWAWA
MONTMAGNY
HAILEYBURY
LA TUQUE
GASPÉ
GRAND FALLS
KENTVILLE

HOUSING

The physical environment in which we live has both direct and indirect impacts on our style of life and on the quality of life we enjoy. Housing constitutes one very important component of the physical environment for all Canadians. The space a person's dwelling provides, its location, cost and physical condition all can affect the quality of life.

The space a dwelling provides may enhance or limit opportunities to pursue hobbies, to socialize, to study, to enjoy privacy and to engage in a host of other activities. Similarly, a dwelling's location may affect the quality of life by facilitating or hindering access to goods and services. The physical condition of a dwelling may affect mental and physical health. Inadequate heating, outmoded or limited electrical facilities, broken-down stairs and so on can contribute to frustration and depression as well as posing health and safety risks. Finally, the cost of housing impinges on individuals' quality of life. Where costs are high, many households may be unable to afford adequate housing or may spend so much for housing that there is not enough money left for other basic expenditures.

Aggregate characteristics of housing can also be seen to affect the quality of life experienced by a community's residents. For example, the density of housing in a community or area will affect the crowding and congestion experienced in utilizing public areas and facilities (e.g., parks, streets, recreation areas and community centres). The composition of the housing stock also may affect individuals' quality of life. Where a large proportion of these dwellings is made up of apartments, the area will have a high level of tenants. Similarly, it is likely that there will be higher proportions of owners in areas with single detached homes. In general, it can be anticipated that, where a large proportion of the stock is owner occupied, the rate of population turnover will be lower, with the result that firm social relationships and pride in the community are more likely to develop.

The measures considered here by no means constitute the full set of potentially useful housing indicators. Rather, they can be seen to provide measures of three of a number of housing concerns. The value of owner-occupied dwellings provides a measure of the affordability of housing while the percentage of dwellings that are owner-occupied gives an indication of the stability of the community. Finally, the persons per room measure indicates the degree of crowding existent in communities.

Other dimensions that are worthy of consideration in the development of future measures include: (1) the structural condition of dwellings (e.g., the number of occupied dwellings in need of repair); (2) the location of housing relative to basic services and amenities (parks, schools, hospitals, places of employment, shopping, public transportation); (3) the appropriateness of housing (the extent to which the particular needs of different types of households are met by their current housing and (4) the availability of appropriate and affordable housing.

AVERAGE VALUE OF OWNER-OCCUPIED DWELLINGS (1976 EST.)

ASPECT MEASURE	The cost of adequate and appropriate housing is for many people a central aspect of the quality of life. If housing costs are high, substantial segments of the population will probably be faced with the choice of living in substandard or inappropriate dwellings in order to minimize costs, or of incurring a large economic burden in order to pay for suitable accommodations. Both of these options can lead to hardships and constraints that diminish the quality of life. One indicator of the extent to which a community's residents are faced with this dilemma is the average value of owner-occupied dwellings. Unless the quality of housing differs significantly among communities, a higher average value for owner-occupied dwellings implies that residents will have to pay more to obtain housing of the same quality than residents in a community with a lower average value. Since rents usually increase as the cost of purchasing one's own house increases, this measure can be seen to bear on the affordability of both owner- and renter-occupied dwellings.	The measure of housing value used here includes single detached, owner-occupied, non-farm dwellings. It is based on owners' estimates of how much they could sell their homes for if they chose to sell. Thus, it should be clear that the measure refers to purchase prices and not to housing costs in the form of taxes, utilities and upkeep. Unfortunately, the only available data for this measure come from the 1971 Census. In order to provide a more realistic representation of current housing values, the 1971 values were updated to 1976 levels through multiplication of the 1971 figures by 1.621 to reflect the increase in the Consumer Price Index for home ownership between 1971 and 1976.[1]
DIFFICULTIES OF INTERPRETATION	There are at least three difficulties to keep in mind when interpreting these data. First, it should be noted that adjusting 1971 values to 1976 values results in the same relative ranking of communities vis-à-vis housing values. Clearly, this relative ranking may fail to reflect changes in ranking that occurred since 1976. Second, the 1971 values on which the measure is based reflect the prices that home-owners believed they could obtain if their homes were sold, not actual sale prices of homes sold in the housing market. Finally, housing value may inaccurately reflect the accessibility of suitable and affordable housing in that suitability and affordability are a function of both household characteristics (e.g., size of household and income) and dwelling characteristics (size of dwelling, physical condition of the unit, purchase price, maintenance costs, etc.).	

[1]See Statistics Canada, *Consumer Prices and Price Indexes,* Cat. 62-010, Jan.-Mar. 1977: Table 8, p. 33.

The five regions can be placed in two distinct groups on the basis of housing values. Highest average values ($31,034 and $29,633) are found in British Columbia and Ontario while significantly lower averages occur in the Atlantic ($23,384), Québec ($24,039), and the Prairies ($24,951). Within regions, variation among communities is greatest in the Atlantic (S = 6912) and least in Québec (S = 3361).

House prices appear to be affected by city growth rates, proximity to metropolitan areas and economic prosperity. Each of these factors can be briefly examined. A centre's growth rate affects the balance of supply and demand in the housing market. Where there is rapid population growth, demand may outrun supply and result in higher house prices. Examples of centres where this phenomenon has taken place are Labrador City, Sept-Îles, Oshawa, Kamloops, Kelowna and Prince George. On the other hand, where the population undergoes a significant decline, an oversupply of housing may occur. In such centres, house prices tend to be relatively low (e.g., Campbellton, Kirkland Lake, Pembroke, Flin Flon, Dawson Creek).

Proximity to metropolitan centres can result in higher house prices due to a spillover of demand from the metropolitan area. In Ontario, Oshawa, Barrie and Guelph may have higher values due to spillover from Toronto while prices in Lincoln are probably affected by the proximity of Hamilton. In the Prairies, the same phenomenon may account for the high house values in Red Deer which is located in the corridor between Calgary and Edmonton.

Finally, income levels and the economic prosperity of a centre are related to housing prices. Where higher incomes are enjoyed by a large segment of the population, the market for larger, better-quality and, presumably, higher-priced dwellings is expanded with the overall result that average prices go up. Places which appear to be more prosperous on the basis of having high average income score and which have correspondingly higher housing values include Sarnia, Simcoe, Guelph, Kingston, Kamloops, Thompson, Fredericton and Charlottetown. Conversely, several places featuring the lowest average incomes and concomitantly low house values are Sydney, Sydney Mines and Gaspé.

a) Overall aggregate values	Average value of owner-occupied dwellings (1976 est.) ($)		
Mean ($\bar{X}$)	26,855		
Standard deviation (S)	5,925		
Maximum	40,686		
Minimum	13,247		
b) By region	$\bar{X}$	S	N
Atlantic	23,384	6,912	17
Québec	24,039	3,361	30
Ontario	29,632	5,617	35
Prairies	24,951	5,750	13
British Columbia	31,034	4,173	17

OTHER MEASURES

Several types of other measures are possible: (i) alternate measure of housing value; (ii) measures of the cost of new housing; (iii) measures of the supply/demand balance, and (iv) affordability indicators. Each of these will be discussed in turn.

i) Alternative Measures of Housing Values

One option is to use the average dollar value of residential property transactions available from the Canadian Real Estate Association. While the association provides annual average price received for homes sold, it only provides this information for regions. In addition, the utility of the data is limited by the fact that only houses sold through the Association's Multiple Listing Service are covered and also that averages sometimes reflect the inclusion of commercial properties.

A second alternative for measuring the value of homes is to use assessment data; however, variation in municipal assessment practices makes this approach questionable.

Third, the Royal Trust Survey of House Prices provides estimates of the selling prices of two standardized types of dwelling. While the use of prices for standardized units facilitates inter-city comparisons, the survey does not cover enough of our communities to be used in this report.

Finally, it would be desirable to complement data on owner-occupied homes with data on average rent levels in order to measure more directly the problems of renters.

ii) Measures of the Cost of New Housing

The average cost of a new, single detached dwelling financed under the NHA is readily available for the 40 largest urban centres on an annual basis (CMHC, *Canadian Housing Statistics*). However, since the NHA finances only modestly priced units, a significant portion of the new housing supply is left out of the measure.

iii) Measures of the Balance of Supply and Demand

In order to indicate whether the supply of new units is keeping pace with increases in the number of households, it would be ideal to have the ratio of housing units to households at several points in time. A similar measure which could be constructed would report the increase in housing units over a specific time period as a percentage of the increase in households during the same time period.

iv) Affordability

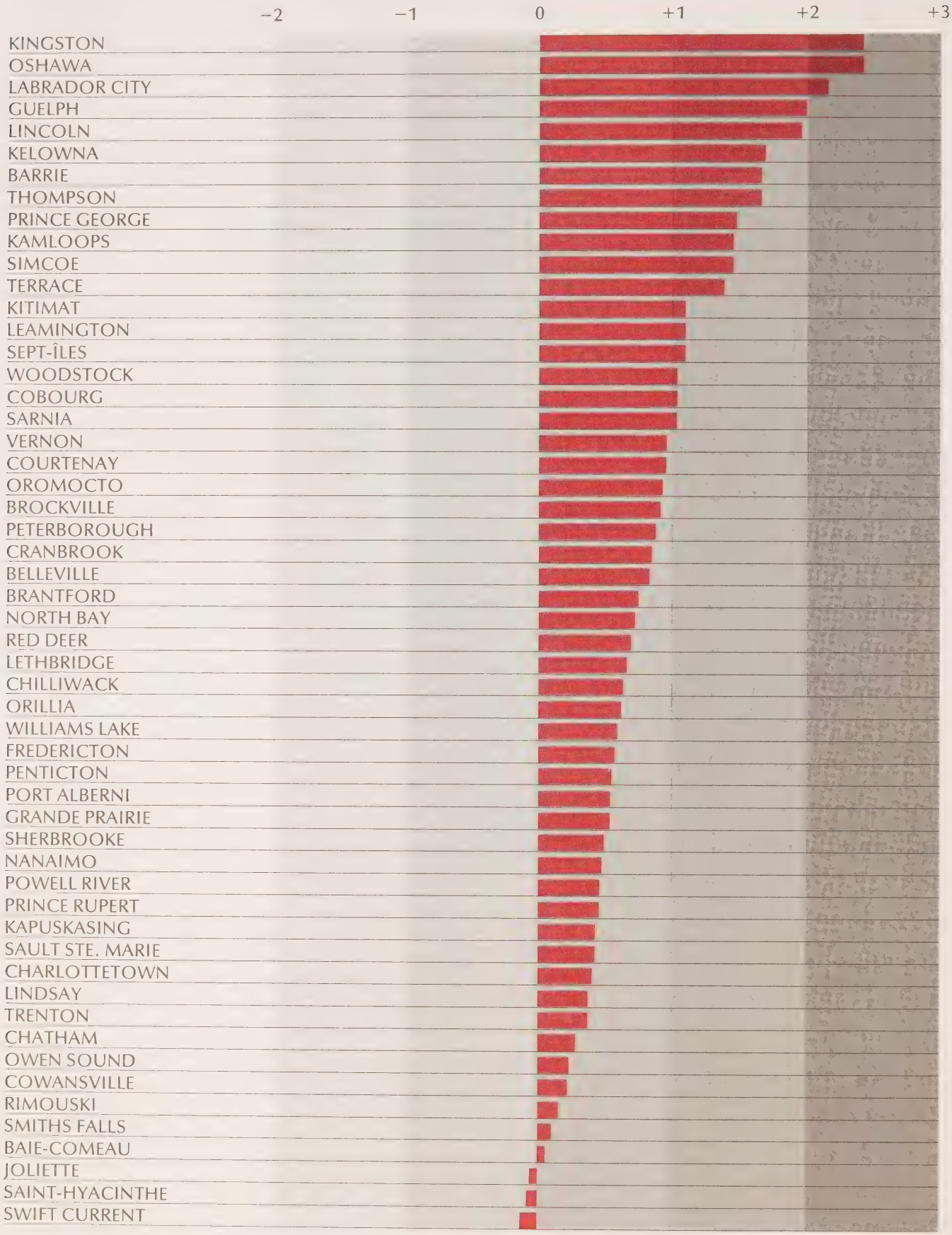
In order to indicate more adequately the extent to which a centre's households are experiencing excessive housing costs, the percentage of homeowners and tenants who spend more than a specified percentage of their current income on housing could be reported. However, this procedure has several drawbacks. First, it is difficult to set a percentage of income expenditure which clearly differentiates those with affordability problems from those without them. To spend 30 per cent (a frequently used standard) of a $25,000 income may not be burdensome, but to spend 30 per cent of a $10,000 income is. Other difficulties are that accumulated wealth is not taken into account in the measure and that some people are willing to trade off expenditures in other areas in order to satisfy their housing preferences.

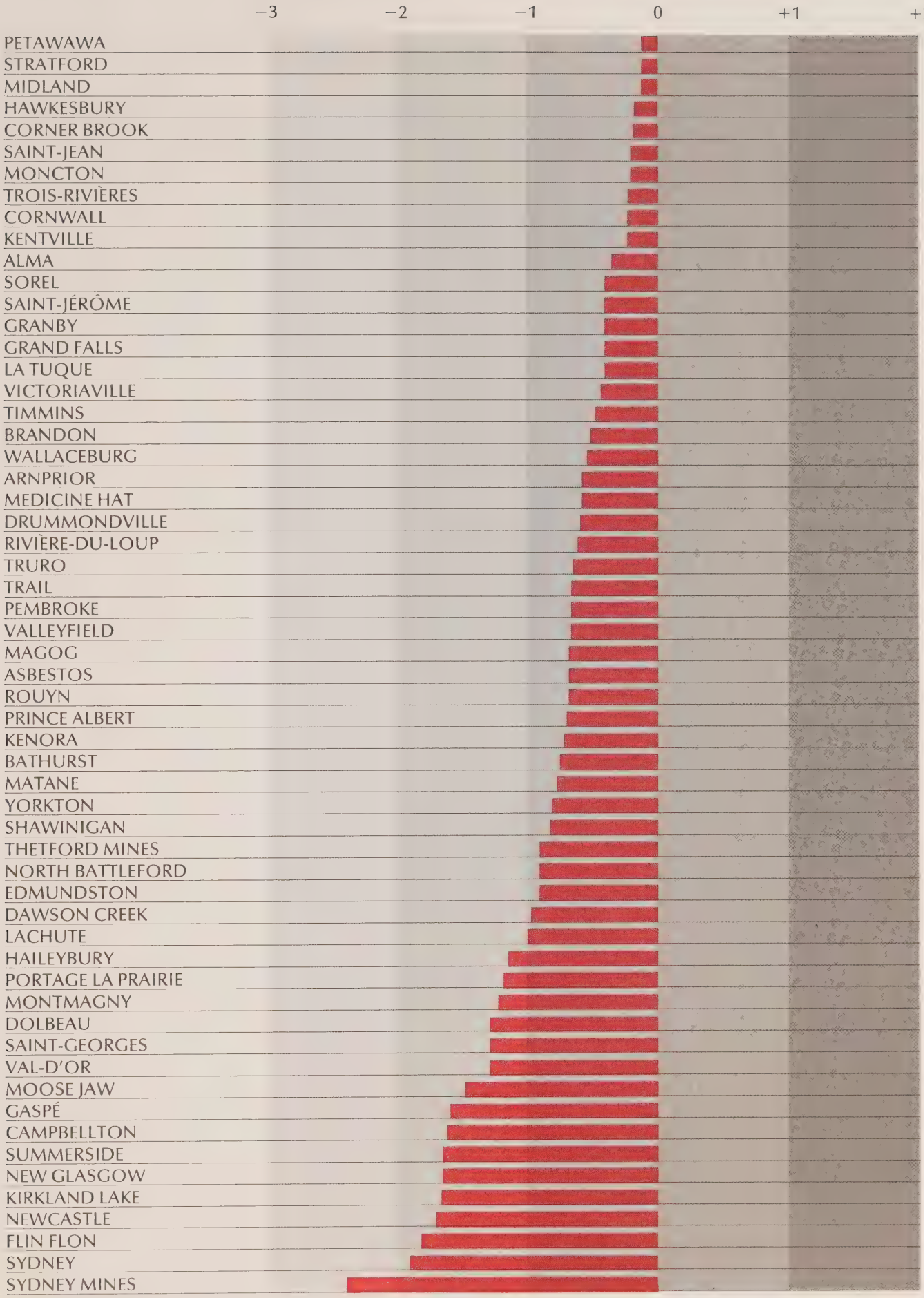
TABLE 15. AVERAGE VALUE OF OWNER-OCCUPIED DWELLINGS (1976 ESTIMATE) ($)

ATLANTIC REGION	Bathurst	22,473	Moncton*	25,749
	Campbellton*	17,677	Newcastle*	16,641
	Charlottetown*	28,985	New Glasgow*	17,208
	Corner Brook	25,892	Oromocto	32,136
	Edmundston	21,836	Summerside*	17,338
	Fredericton*	30,204	Sydney*	15,300
	Grand Falls*	24,682	Sydney Mines*	13,246
	Kentville*	25,558	Truro*	22,867
	Labrador City*	39,730		
QUÉBEC REGION	Alma	25,211	Rivière-du-Loup	23,220
	Asbestos*	22,702	Rouyn*	22,692
	Baie-Comeau*	26,991	Saint-Georges*	19,615
	Cowansville	27,920	Saint-Hyacinthe*	26,608
	Dolbeau*	19,662	Saint-Jean*	25,762
	Drummondville*	23,264	Saint-Jérôme*	24,843
	Gaspé	17,895	Sept-Îles	33,496
	Granby*	24,841	Shawinigan*	22,398
	Joliette*	26,634	Sherbrooke*	29,847
	Lachute*	20,954	Sorel*	24,879
	La Tuque	24,561	Thetford Mines*	21,888
	Magog*	22,778	Trois-Rivières*	25,720
	Matane	22,437	Val-d'Or*	19,550
	Montmagny	19,691	Valleyfield*	22,802
	Rimouski*	27,877	Victoriaville*	24,402
ONTARIO REGION	Arnprior*	23,684	Midland	26,115
	Barrie*	36,662	North Bay	31,295
	Belleville	31,714	Orillia	30,421
	Brantford*	31,342	Oshawa*	40,581
	Brockville	32,056	Owen Sound	28,244
	Chatham	28,427	Pembroke*	22,807
	Cobourg*	33,068	Petewawa*	26,488
	Cornwall	25,592	Peterborough*	31,914
	Guelph*	38,858	Sarnia*	32,976
	Haileybury*	20,163	Sault Ste Marie*	29,173
	Hawkesbury*	23,986	Simcoe	35,584
	Kapuskasing	29,302	Smiths Falls*	27,500
	Kenora*	22,609	Stratford	26,232
	Kingston*	40,685	Timmins*	24,123
	Kirkland Lake	17,151	Trenton*	28,678
	Leamington	33,546	Wallaceburg	23,859
	Lincoln	38,281	Woodstock	33,129
	Lindsay	28,886		
PRAIRIES REGION	Brandon	23,953	Portage la Prairie	20,017
	Flin Flon*	16,231	Prince Albert	22,689
	Grande Prairie	29,896	Red Deer	30,988
	Lethbridge	30,781	Swift Current	26,502
	Medicine Hat*	23,679	Thompson	36,636
	Moose Jaw	18,725	Yorkton	22,420
	North Battleford*	21,846		
BRITISH COLUMBIA REGION	Chilliwack*	30,432	Port Alberni*	30,127
	Courtenay*	32,385	Powell River	29,534
	Cranbrook	31,776	Prince George*	35,657
	Dawson Creek	21,176	Prince Rupert*	29,576
	Kamloops*	35,590	Terrace*	34,828
	Kelowna*	37,085	Trail*	22,841
	Kitimat	33,682	Vernon	32,757
	Nanaimo*	29,722	Williams Lake*	30,327
	Penticton	30,136		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Calculated from *Statistics Canada, 1971 Census, Characteristics of Census Agglomerations*, Cat. 98-702; *Consumer Prices & Price Indexes*, Cat. 62-0101, Jan.-Mar. 1977; Table 8, p. 33; *Statistics Canada, 1971 Census of Canada: "Values and Rents,"* Cat. 93-732 (Ottawa: 1973).

GRAPH 13. AVERAGE VALUE OF OWNER-OCCUPIED DWELLINGS (1976 ESTIMATE) ($)
(Z Scores)




−3
−2
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0
+1
+2
PETAWAWA
STRATFORD
MIDLAND
HAWKESBURY
CORNER BROOK
SAINT-JEAN
MONCTON
TROIS-RIVIÈRES
CORNWALL
KENTVILLE
ALMA
SOREL
SAINT-JÉRÔME
GRANBY
GRAND FALLS
LA TUQUE
VICTORIAVILLE
TIMMINS
BRANDON
WALLACEBURG
ARNPRIOR
MEDICINE HAT
DRUMMONDVILLE
RIVIÈRE-DU-LOUP
TRURO
TRAIL
PEMBROKE
VALLEYFIELD
MAGOG
ASBESTOS
ROUYN
PRINCE ALBERT
KENORA
BATHURST
MATANE
YORKTON
SHAWINIGAN
THETFORD MINES
NORTH BATTLEFORD
EDMUNDSTON
DAWSON CREEK
LACHUTE
HAILEYBURY
PORTAGE LA PRAIRIE
MONTMAGNY
DOLBEAU
SAINT-GEORGES
VAL-D'OR
MOOSE JAW
GASPÉ
CAMPBELLTON
SUMMERSIDE
NEW GLASGOW
KIRKLAND LAKE
NEWCASTLE
FLIN FLON
SYDNEY
SYDNEY MINES

OWNER-OCCUPIED DWELLINGS AS A PERCENTAGE OF ALL HOUSING STOCK (1976)

ASPECT MEASURED

For many Canadians, homeownership is a highly desired goal. Homeownership usually brings a strong sense of personal satisfaction. Further, homeownership provides residents with security of tenure as well as the benefits of having a relatively secure financial investment. Finally, from the residents' perspective, ownership provides greater freedom to adapt their dwelling to suit their own tastes and lifestyles.

From the community pespective, persons who own their own homes are more likely to stay in the community and to contribute time and energy to maintaining their dwellings, their neighbourhoods and the wider community, if for no other reason than to protect their investment. Thus, from both the individual and community perspectives, home ownership can be seen to be positively related to the quality of life.

The measure of homeownership used here is the percentage of all types of residential dwellings which are owner-occupied. The data used to calculate this measure are derived from the 1976 Census.

DIFFICULTIES OF INTERPRETATION

Rates of homeownership are at least in part a function of the age, sex and marital status of household heads in the communities. Generally, young adults, singles and single-parent families are less likely to own their own home either because they see no need to own a dwelling or because their financial position does not allow them to purchase one. To facilitate more exact comparisons between communities, the measure could, therefore, be limited to homeownership rates among the appropriate demographic groups which exhibit a greater need and capability for homeownership, such as families with household heads aged 30-60 that have children living at home.

The average percentage of dwellings that are owner-occupied for all medium-sized Canadian centres is 62.0 percent. The proportion of owner-occupied homes ranges from a low of 15.9 percent[2] in Oromocto to a high of 85.1 percent in Sydney Mines.

Centres in British Columbia, the Prairies and Ontario all have averages which are higher than the national average for all medium-sized cities. British Columbia centres stand out by virtue of having the highest regional rate of owner-occupied dwellings (68.5 percent) and in showing little variation in scores. Prairie communities rank next in line with an average of 65.6 percent owner-occupied dwellings closely followed by the Ontario cities where the average is 64.6 percent. The rate of owner occupancy in the Maritimes approximates the national average (61.1 percent) but tenure patterns in Québec communities are significantly below the rest, averaging only 54.2 percent owner occupancy in 1976.

The most prominent factor related to homeownership rates is cultural. In cities where the Francophone population is proportionately high, there are uniformly lower levels of homeownership. Reduced levels of homeownership are also found in adjacent centres in northern New Brunswick and Ontario which have substantial Francophone populations (e.g., Cornwall, Hawkesbury, Edmundston, Campbellton). Within Québec itself, the more populous centres, (e.g., Sherbrooke, Shawinigan and Trois Rivières), including the manufacturing cities near Montréal, (e.g., Saint-Hyacinthe, Saint-Jean, Saint-Jérôme, Granby) have the lowest levels of homeownership.

The determinants of homeownership in medium-sized cities are not clear-cut. The level of homeownership is likely affected by local traditions, building practices and market conditions. Some remote single-industry towns, which are substantially influenced by policies of the dominant company, record high rates of homeownership (e.g., Corner Brook, Labrador City, Thetford Mines, Powell River and Kitimat) while other similar communities have low or modest levels of owner occupancy (e.g., Asbestos, Sept-Îles, Thompson). Clearly, the degree of homeownership does not necessarily reflect the size or physical quality of the home or the current level of economic prosperity experienced by residents of the community. Some centres, situated in economically peripheral regions, have very high levels of owner occupancy (e.g., Sydney, Sydney Mines, Gaspé) while other more economically prosperous centres have only a modest degree of owner occupancy (e.g., Sept-Îles, Kingston, Red Deer). In a few centres, government administrative practices may affect levels of owner occupancy. For example, lower than average levels of homeownership in Oromocto and Petawawa are attributable to the presence of major military installations and provision of accommodation for defence personnel.

[2]Oromocto's low proportion of homes owned probably results from the presence of a substantial military base.

a) Overall aggregate values	Percentage of owner-occupied dwellings		
Mean ($\bar{X}$)	62.0		
Standard deviation (S)	9.7		
Maximum	85.1		
Minimum	15.9		
b) By region	$\bar{X}$	S	N
Atlantic	61.1	14.2	17
Québec	54.2	7.9	30
Ontario	64.6	6.6	35
Prairies	65.6	5.4	13
British Columbia	68.5	5.0	17

OTHER MEASURES

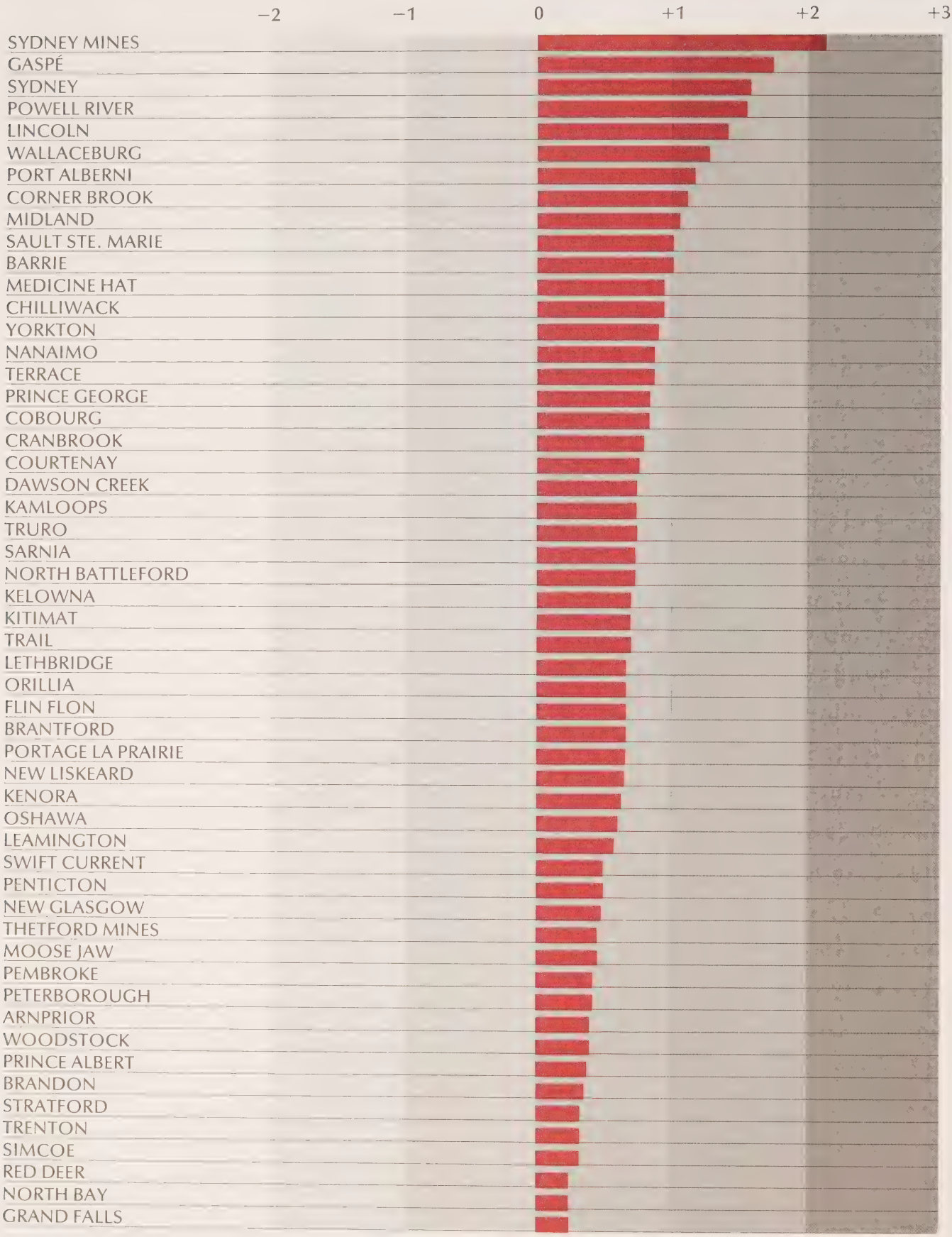
Other measures include those based on housing characteristics which, in large part, co-vary with levels of homeownership such as housing type and size of dwelling unit. More specifically, apartments as a percentage of housing stock and the percentage of the city population that resides in apartments can be used as inverse indicators of ownership, while the percentage of dwellings with more than a specific number of bedrooms or square footage can serve as a direct proxy for ownership.

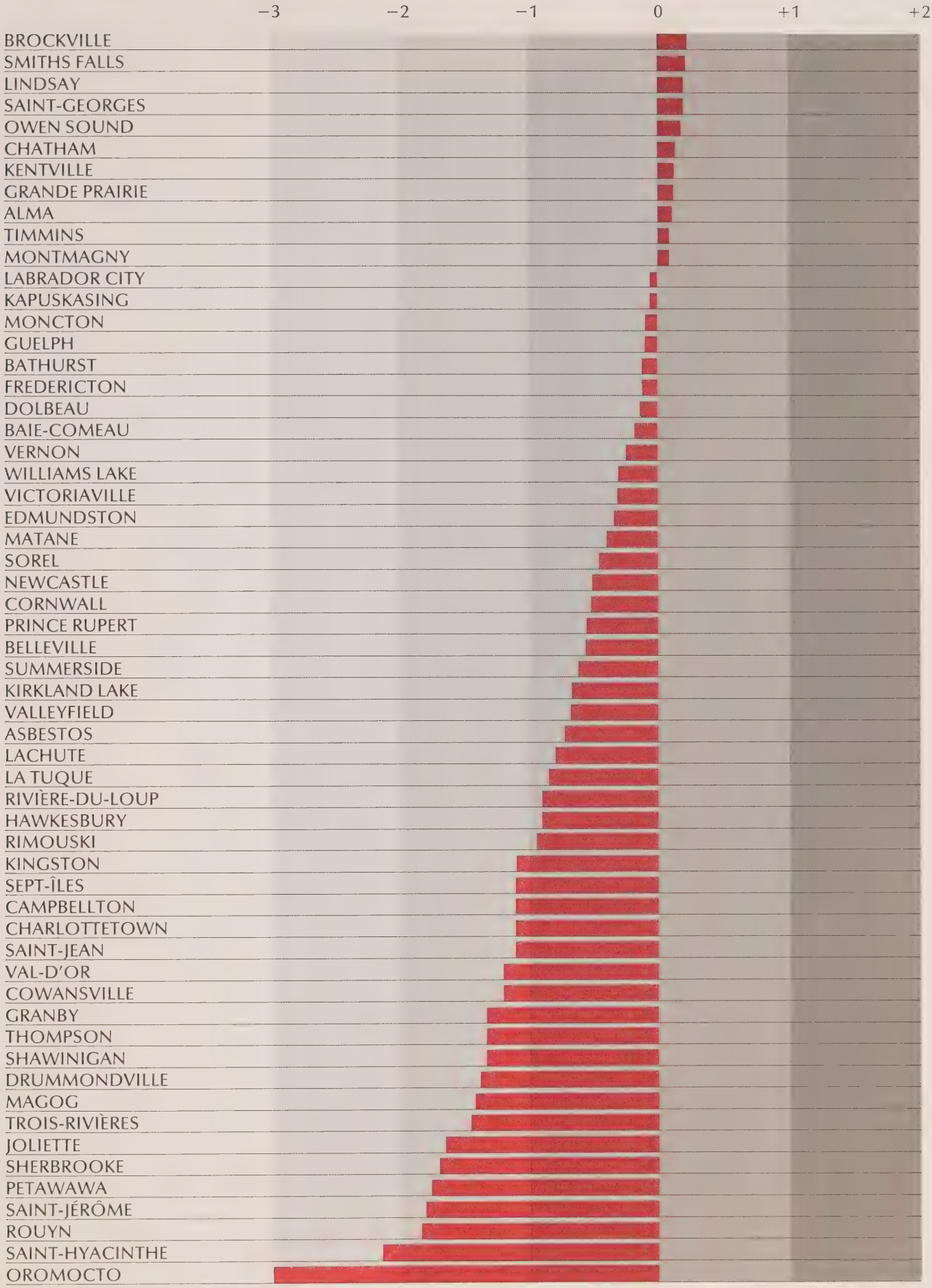
TABLE 16. PERCENTAGE OF DWELLINGS OWNER-OCCUPIED (1976)

ATLANTIC REGION	Bathurst	61.3%	Moncton*	61.3%
	Campbellton	51.4%	Newcastle+	58.0%
	Charlottetown+	51.4%	New Glasgow+	66.9%
	Corner Brook	73.5%	Oromocto	15.9%
	Edmundston	59.1%	Summerside	56.5%
	Fredericton	60.9%	Sydney*	78.2%
	Grand Falls	64.4%	Sydney Mines*	85.1%
	Kentville	63.1%	Truro*	69.4%
	Labrador City	61.6%		
QUÉBEC REGION	Alma	62.9%	Rivière-du-Loup	53.1%
	Asbestos	55.1%	Rouyn*	43.4%
	Baie-Comeau*	60.2%	Saint-Georges+	63.4%
	Cowansville	50.6%	Saint-Hyacinthe*	41.9%
	Dolbeau+	60.7%	Saint-Jean*	50.7%
	Drummondville*	49.1%	Saint-Jérôme*	44.1%
	Gaspé	80.1%	Sept-Îles	52.0%
	Granby*	50.0%	Shawinigan*	49.8%
	Joliette*	46.5%	Sherbrooke*	44.7%
	Lachute	53.6%	Sorel*	58.4%
	La Tuque	53.4%	Thetford Mines*	66.4%
	Magog	48.7%	Trois-Rivières*	48.1%
	Matane	58.5%	Val-d'Or	50.6%
	Montmagny	62.7%	Valleyfield*	55.3%
	Rimouski*	52.5%	Victoriaville*	59.5%
ONTARIO REGION	Arnprior	65.9%	Midland*	73.1%
	Barrie*	71.9%	New Liskeard	67.9%
	Belleville	57.2%	North Bay*	64.5%
	Brantford*	68.1%	Orillia	68.1%
	Brockville*	64.2%	Oshawa*	67.7%
	Chatham	63.1%	Owen Sound	63.3%
	Cobourg+	70.3%	Pembroke+	66.2%
	Cornwall	57.8%	Petewawa+	44.4%
	Guelph*	61.3%	Peterborough*	66.2%
	Hawkesbury	52.8%	Sarnia*	69.2%
	Kapuskasing	61.5%	Sault Ste Marie*	73.0%
	Kenora	67.9%	Simcoe	65.3%
	Kingston*	52.1%	Smiths Falls	59.9%
	Kirkland Lake	55.4%	Stratford	65.5%
	Leamington	67.7%	Timmins	62.8%
	Lincoln	76.8%	Trenton*	65.5%
	Lindsay	63.8%	Wallaceburg	75.2%
			Woodstock	65.8%
PRAIRIES REGION	Brandon	65.5%	Portage la Prairie	67.9%
	Flin Flon	68.1%	Prince Albert	65.6%
	Grande Prairie	63.0%	Red Deer	59.5%
	Lethbridge	68.1%	Swift Current	67.3%
	Medicine Hat*	71.5%	Thompson	50.0%
	Moose Jaw*	66.3%	Yorkton	71.0%
	North Battleford	69.1%		
BRITISH COLUMBIA REGION	Chilliwack	71.4%	Port Alberni*	74.1%
	Courtenay+	69.5%	Powell River	79.9%
	Cranbrook	69.9%	Prince George	70.3%
	Dawson Creek	69.4%	Prince Rupert	57.4%
	Kamloops	69.4%	Terrace	70.8%
	Kelowna	68.9%	Trail	68.8%
	Kitimat	68.9%	Vernon	59.8%
	Nanaimo	70.9%	Williams Lake	59.7%
	Penticton	67.1%		

NOTES: 1976 boundaries are used for all urban areas.
*Denotes Census Agglomerations (1976 boundaries).
+Adjoining municipalities with an urban population of 5,000 or more (1976 boundaries).
In all the tables based on the 1971 Census of Canada, data are reported for the Haileybury C.A. However, in 1976, this data was no longer available as Haileybury ceased to be listed as a C.A. Data is given instead for the town of New Liskeard which is the largest agglomeration in the area.
SOURCE: Statistics Canada, *1976 Census of Canada, Dwellings and Households, Occupied Private Dwellings by Structural Type & Tenure,* Cat. 93-802 (Ottawa: 1978).

GRAPH 14. PERCENTAGE OF DWELLINGS OWNER-OCCUPIED (1976)
(Z Scores)




−3
−2
−1
0
+1
+2
BROCKVILLE
SMITHS FALLS
LINDSAY
SAINT-GEORGES
OWEN SOUND
CHATHAM
KENTVILLE
GRANDE PRAIRIE
ALMA
TIMMINS
MONTMAGNY
LABRADOR CITY
KAPUSKASING
MONCTON
GUELPH
BATHURST
FREDERICTON
DOLBEAU
BAIE-COMEAU
VERNON
WILLIAMS LAKE
VICTORIAVILLE
EDMUNDSTON
MATANE
SOREL
NEWCASTLE
CORNWALL
PRINCE RUPERT
BELLEVILLE
SUMMERSIDE
KIRKLAND LAKE
VALLEYFIELD
ASBESTOS
LACHUTE
LA TUQUE
RIVIÈRE-DU-LOUP
HAWKESBURY
RIMOUSKI
KINGSTON
SEPT-ÎLES
CAMPBELLTON
CHARLOTTETOWN
SAINT-JEAN
VAL-D'OR
COWANSVILLE
GRANBY
THOMPSON
SHAWINIGAN
DRUMMONDVILLE
MAGOG
TROIS-RIVIÈRES
JOLIETTE
SHERBROOKE
PETAWAWA
SAINT-JÉRÔME
ROUYN
SAINT-HYACINTHE
OROMOCTO

CROWDED DWELLINGS: PERCENTAGE OF DWELLINGS WITH 1.1 OR MORE PERSONS PER ROOM (1971)

ASPECT MEASURED

A common finding of housing studies is that people generally prefer more rather than less dwelling space. Hence, household density (the amount of living space per person in a housing unit) may be regarded as a rough indicator of residential satisfaction. The measure identifies the proportion of households residing in moderately crowded circumstances, thus illustrating a distributional aspect of the situation.

The amount of space that a person has in his/her living quarters can directly influence the quality of life experienced. More space allows individuals to engage in a greater range of activities (e.g., having social gatherings, pursuing hobbies or engaging in indoor recreation) and affords more privacy. However, as a measure of residential satisfaction, household density is relatively crude, since it is often the internal dwelling layout and the use of space which more strongly affect the behaviour and satisfaction of residents. Similarly, the rating of household density should not be construed as an indicator of social pathology. The bulk of research to date has yielded no convincing evidence that crowded housing conditions of the extent experienced in Canada produce significant adverse effects on people's health, attitudes or behaviour. Although crowded living situations may exacerbate other stresses experienced, the weight of the research suggests that pathogenic effects are more strongly related to social and economic factors such as low incomes and large families which are often correlated with crowded dwellings.

The percentage of dwellings which have 1.1 or more persons per room in 1971 is utilized to indicate the level of crowding in medium-sized Canadian centres. The data for this measure was obtained from the 1971 Census. Scores for centres with populations from 10 000 to 25 000 were calculated from data provided in a special tabulation by Statistics Canada. For the remaining centres, scores are calculated from data in Statistics Canada's 1971 Census Bulletin.[3]

In both cases, calculation involved dividing the number of occupied dwellings with 1.1 or more persons per room by the total number of occupied dwellings in the community. The calculation of persons per room ratio for each household was carried out by Statistics Canada (total number of persons in the household divided by the number of rooms in the dwelling equals the number of persons per room). "Rooms" refers to enclosed areas within a dwelling which are finished and suitable for year-round living. Partially divided L-shaped rooms are considered to be separate rooms if they are considered to be such by the respondent. Not counted as rooms are bathrooms, closets, pantries, halls and rooms used solely for business purposes.

[3]Statistics Canada, *1971 Census of Canada: Number of Persons per Room,* Cat. 93-730 (Ottawa: 1973).

DIFFICULTIES OF INTERPRETATION

The ratio of persons per room in a dwelling can prove misleading since the number of "public rooms" in a dwelling — kitchen, dining room, living room, family room — is unlikely to increase systematically with household size. The result of this is that larger households tend to have higher ratios than smaller households even when the "private" space available to household members is the same. To resolve this difficulty, the measure number of persons per bedroom is sometimes employed.

Also, the use of an arbitrary cut-off point poses a problem. Whether a household with 1.1 persons or more per room experiences more crowding than a household with 1.0 persons per room depends a good deal on the size of rooms as well as the social characteristics of the households (a family household in contrast to a non-family one is likely to require less by way of individual bedrooms, as will a family with small children in comparison to a family with teenagers).

It should also be noted that the measure identifies the number of dwellings rather than the number of people affected by crowded conditions. Two cities with the same percentages of crowded dwellings may have substantially different numbers of people experiencing crowding.

URBAN PATTERN

The average percentage of crowded dwellings in all medium-sized centres is 10.5 per cent. As was the case with homeownership, an east-west split is evident when regional averages are examined. The averages for Atlantic and Québec centres are almost twice the levels of crowding experienced in Ontario, Prairie and British Columbia communities. The Atlantic centres show the greatest variation in crowding within the region (S=4.8), while Québec centres show the least variation (S=2.9). The relatively uniform high crowding scores found in Québec centres contrasts sharply with the relatively uniform low crowding found in centres of the adjacent province of Ontario. As one moves farther west, the extent of crowding increases somewhat but still stays well below the extent found in eastern regions. The Prairie centres average 8.1 per cent crowded dwellings and British Columbia centres average 8.9 per cent.

Generally, communities with higher proportions of crowded dwellings tend to fall into one of three types of smaller urban centres. The first type is made up of economically robust, rapidly growing resource towns (e.g., Labrador City, Sept-Îles, Thompson, Williams Lake). Hinterland cities that have experienced economic stagnation (e.g., Grand Falls, Sydney Mines, Gaspé) constitute the second type. In the third category are Québec communities which have traditionally featured fewer large, single detached dwellings, more rental units and larger household sizes (although the household-size level is now approaching the Canadian average). Some of the factors which help to account for the higher rates of crowding in these types of communities can be mentioned here.

First, in rapidly growing resource towns crowding is likely to result from the rate of population growth outrunning the rate of residential construction. The rapid growth in employment opportunities often results in a rapid influx of population. In order for this influx to be accommodated, earlier arrivals may take newcomers as boarders and households may double up (i.e., two independent households may share the same dwelling), resulting in a high proportion of crowded dwellings.

In the second type of community, hinterland cities undergoing economic stagnation, incomes tend to be low and unemployment tends to be high. As a consequence, many households may have to make do with smaller, less expensive accommodations, or may have to double up. In addition, economic stagnation means there is less money in the community to stimulate the local construction industry to build more housing.

The higher proportion of crowded dwellings found in Québec centres may be partially attributed to the remnants of an earlier social structure characterized by large families and extended households residing under one roof. The unique housing profile of urban Québec, which features a high proportion of rental dwellings and apartments (which usually have less space than single detached units), also contributes to the heightened level of crowded dwellings.

a) Overall aggregate values	Crowded dwellings: percentage with 1.1 or more persons per room (1971)		
Mean ($\bar{X}$)	10.5		
Standard deviation (S)	4.8		
Maximum	22.0		
Minimum	4.0		
b) By region	$\bar{X}$	S	N
Atlantic	14.0	4.8	17
Québec	14.1	2.9	30
Ontario	7.3	3.1	35
Prairies	8.1	4.2	13
British Columbia	8.9	4.1	17

OTHER MEASURES

To circumvent the limitations posed by use of rooms or bedrooms in measures of household density, data on room dimensions may be collected.[4] Dwelling area, then, refers to the total area, in square metres, of all the rooms in the dwelling, calculated from these reported room dimensions, thus eliminating the error factor introduced by variation in room size. Given the well-documented tendency for the proportion of households residing in crowded circumstances to increase with household size and to be associated with a specific stage of the lifecycle, namely, families with children, the housing density measure may be particularly focussed on those groups with the greatest propensity to live in crowded conditions (e.g., households with four or more persons or families with two or more children).[5] Hence, a measure of housing density may be formulated as "Proportion of households with four or more persons residing in dwellings with less than 18.6 m^2 per person".

Measures of geographic or site density also can be sought. Examples of such indicators include, in order of increasing precision, dwellings per hectare, persons per hectare, persons per net residential hectare and persons or households per block fare, standardized per front footage. In regard to density and residential satisfaction, the effect of this approach is to broaden the focus from the dwelling unit itself to encompass the wider neighbourhood.

[4]Central Mortgage and Housing Corporation, *1974 Survey of Housing Units, Background Information and Statistical Notes* (Ottawa: CHMC, Program and Market Requirements Division, 1977).

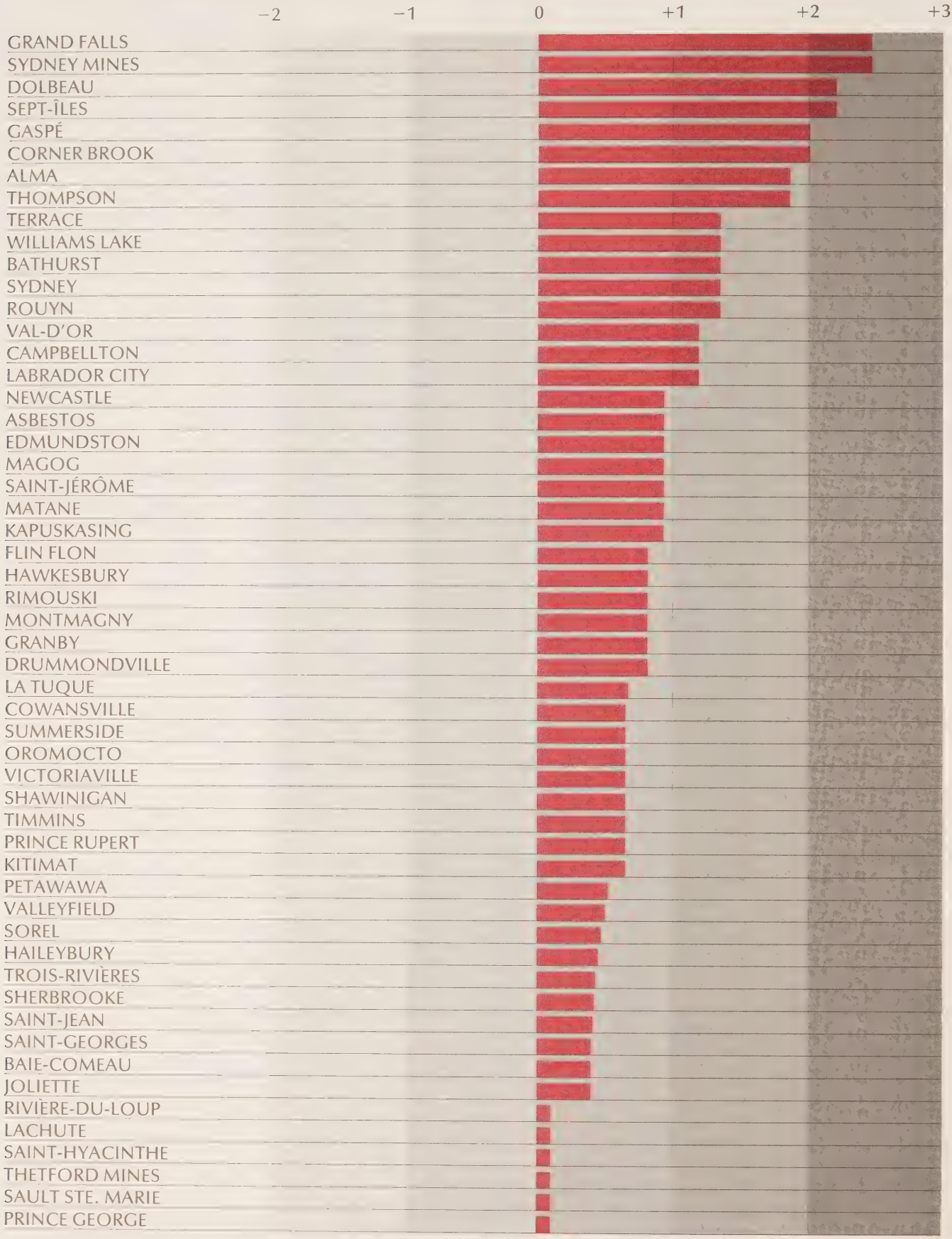
[5]M. Ycas, "The Housing Indicators at Hand", *The Statistical Review of Canada*, Aug. 1978. Cat 11-003.

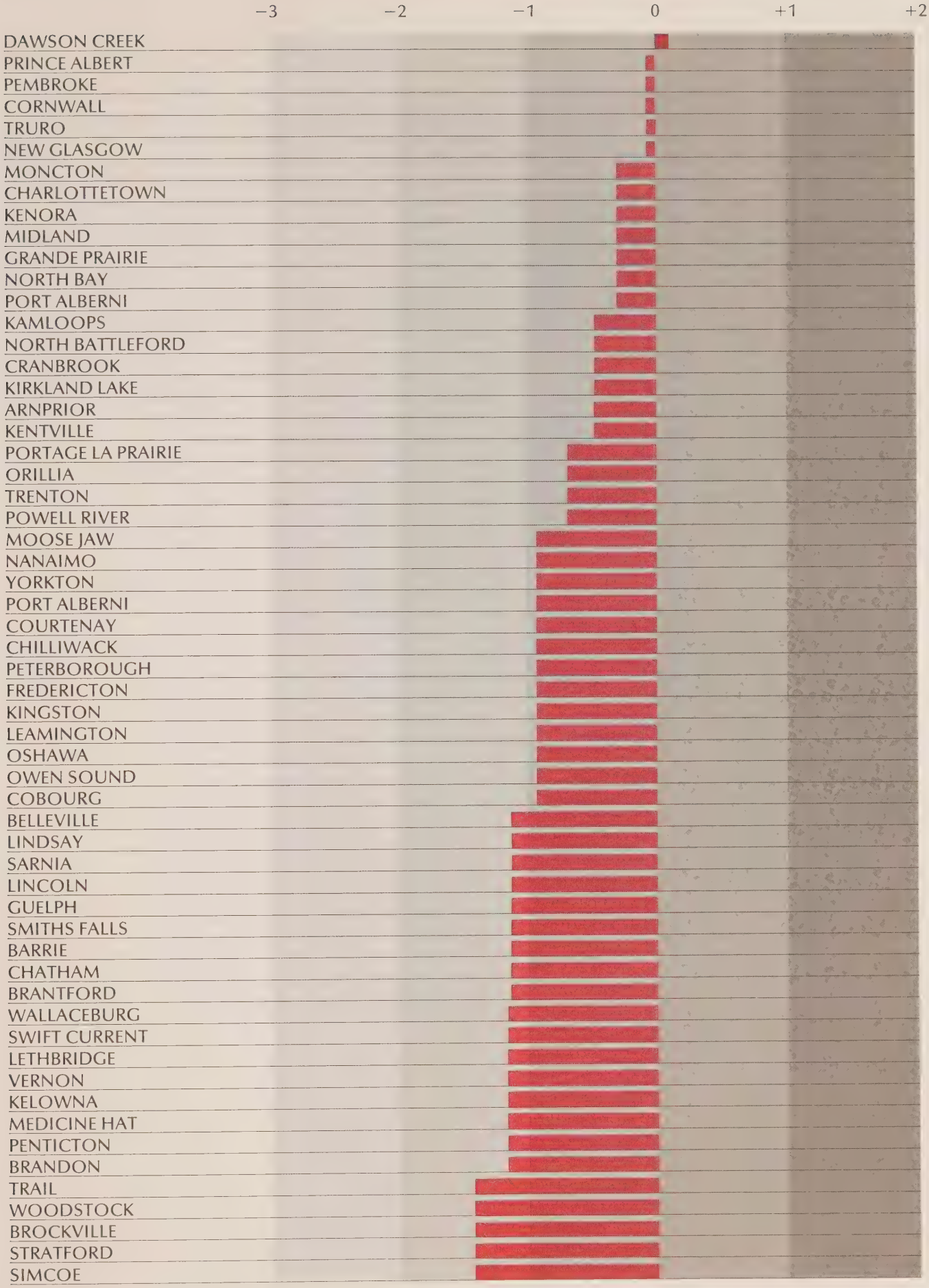
TABLE 17. CROWDED DWELLINGS: PERCENTAGE OF OCCUPIED DWELLINGS WITH 1.1 OR MORE PERSONS PER ROOM (1971)

ATLANTIC REGION	Bathurst	17	Moncton*	9
	Campbellton*	16	Newcastle*	15
	Charlottetown*	9	New Glasgow*	10
	Corner Brook	20	Oromocto	13
	Edmundston	15	Summerside*	13
	Fredericton*	6	Sydney*	17
	Grand Falls*	22	Sydney Mines*	22
	Kentville*	8	Truro*	10
	Labrador City*	16		
QUÉBEC REGION	Alma	19	Rivière-du-Loup	11
	Asbestos*	15	Rouyn*	17
	Baie-Comeau*	12	Saint-Georges*	12
	Cowansville	13	Saint-Hyacinthe*	11
	Dolbeau*	21	Saint-Jean*	12
	Drummondville*	14	Saint-Jérôme*	15
	Gaspé	20	Sept-Îles	21
	Granby*	14	Shawinigan*	13
	Joliette*	12	Sherbrooke*	12
	Lachute*	11	Sorel*	12
	La Tuque	13	Thetford Mines*	11
	Magog*	15	Trois-Rivières*	12
	Matane	15	Val-d'Or*	16
	Montmagny	14	Valleyfield*	12
	Rimouski*	14	Victoriaville*	13
ONTARIO REGION	Arnprior*	8	Midland*	9
	Barrie*	5	North Bay	9
	Belleville	5	Orillia	7
	Brantford*	5	Oshawa*	6
	Brockville	4	Owen Sound	5
	Chatham	5	Pembroke*	10
	Cobourg*	5	Petawawa*	12
	Cornwall	10	Peterborough*	6
	Guelph*	5	Sarnia*	5
	Haileybury*	12	Sault Ste. Marie*	11
	Hawkesbury*	14	Simcoe	2
	Kapuskasing	15	Smiths Falls*	5
	Kenora*	9	Stratford	4
	Kingston*	6	Timmins*	13
	Kirkland Lake	8	Trenton*	7
	Leamington	6	Wallaceburg	5
	Lincoln	5	Woodstock	4
	Lindsay	5		
PRAIRIES REGION	Brandon	5	Portage la Prairie	7
	Flin Flon*	14	Prince Albert	10
	Grande Prairie	9	Red Deer	6
	Lethbridge	5	Swift Current	5
	Medicine Hat*	5	Thompson	19
	Moose Jaw	6	Yorkton	6
	North Battleford*	8		
BRITISH COLUMBIA REGION	Chilliwack*	6	Port Alberni*	9
	Courtenay*	6	Powell River	7
	Cranbrook	8	Prince George*	11
	Dawson Creek	11	Prince Rupert*	13
	Kamloops*	8	Terrace*	17
	Kelowna*	5	Trail*	4
	Kitimat	13	Vernon	5
	Nanaimo*	6	Williams Lake*	17
	Penticton	5		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Statistics Canada, Special Tabulations from the 1971 Census, May 1977.

GRAPH 15. CROWDED DWELLINGS: PERCENTAGE OF OCCUPIED DWELLINGS WITH 1.1 OR MORE PERSONS PER ROOM (1971) (Z Scores)

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−1
0
+1
+2
DAWSON CREEK
PRINCE ALBERT
PEMBROKE
CORNWALL
TRURO
NEW GLASGOW
MONCTON
CHARLOTTETOWN
KENORA
MIDLAND
GRANDE PRAIRIE
NORTH BAY
PORT ALBERNI
KAMLOOPS
NORTH BATTLEFORD
CRANBROOK
KIRKLAND LAKE
ARNPRIOR
KENTVILLE
PORTAGE LA PRAIRIE
ORILLIA
TRENTON
POWELL RIVER
MOOSE JAW
NANAIMO
YORKTON
PORT ALBERNI
COURTENAY
CHILLIWACK
PETERBOROUGH
FREDERICTON
KINGSTON
LEAMINGTON
OSHAWA
OWEN SOUND
COBOURG
BELLEVILLE
LINDSAY
SARNIA
LINCOLN
GUELPH
SMITHS FALLS
BARRIE
CHATHAM
BRANTFORD
WALLACEBURG
SWIFT CURRENT
LETHBRIDGE
VERNON
KELOWNA
MEDICINE HAT
PENTICTON
BRANDON
TRAIL
WOODSTOCK
BROCKVILLE
STRATFORD
SIMCOE

Since the production of goods and the provision of many services take place in specific geographic locations, it is necessary for workers and clients to travel to these locations. Travel to work, to shop or to be entertained requires transportation facilities. As a link among people and between people and services, transportation is crucial.

While many people travel by private automobile, our focus here is on public transportation. Public transportation is of special interest for a number of reasons. First, it is likely to be the primary means of transportation for those who do not have regular access to a car (those who cannot drive, do not own a car or must share a car with family members). Where public transportation is unavailable, a substantial portion of the community's population may find themselves unable to participate fully in community life. Second, the negative effects on the quality of life created by the relatively unrestricted use of the automobile (e.g., pollution, traffic congestion, etc.), coupled with the realization of the need for energy conservation suggest that improvement or even maintenance of the current quality of life may require expansion of public transportation and the reduction of private modes of transport.

The two measures of public transit to be presented are the annual number of fare-paying passengers carried per capita on public transportation and the annual revenue vehicle kilometres travelled per capita by public transportation vehicles. The first of these can be taken as an indicator of both the supply and demand for transportation while the second provides a crude measure of supply or availability of service. It should be noted that the measures share certain flaws. First, the data are somewhat out of date (1974). Second, the area serviced by a public transportation system may not correspond precisely with community boundaries.

PUBLIC TRANSPORTATION (RIDERSHIP): ANNUAL FARE PASSENGERS CARRIED PER CAPITA 1974)

ASPECT MEASURED	Variations in the extent to which public transit is used can affect the quality of life in urban centres. Where public transit is heavily used there may be benefits in terms of reduced air and noise pollution and decreased traffic congestion. In addition, to the degree that use of public transit results in less use of private automobiles, it may be possible to orient downtown cores more to pedestrians than cars (e.g., replacement of parking lots with stores, parks, the development of pedestrian malls).	The measure of the use of public transit presented here is the number of one-way fare passengers carried per capita in 1974. It is calculated by dividing the total number of one-way fares paid in 1974 by the number of people living in the community. The data for the measure were provided by the Canadian Urban Transit Association which, in turn, obtains its information from individual transit companies.
DIFFICULTIES OF INTERPRETATION	Perhaps the greatest problem with this measure is conceptual ambiguity. On one hand, the rate of public transit use can be seen to indicate demand for such service. On the other hand, use is a function of supply as well as demand. Thus, low rates of utilization may indicate poorly planned routes, poor scheduling, an inadequate number of vehicles and other supply conditions rather than a low demand for public transit. In sum, the rate of use must be viewed as a measure of both the supply of and demand for public transit.	Two other problems of interpretation also should be mentioned. First, the area serviced by a public transit system may not correspond precisely with municipal boundaries. Second, some privately owned companies in eastern Canada do not collect or do not report operating figures to the Canadian Urban Transit Association.
URBAN PATTERN	Because only a small number of centres in the Maritimes, Québec and British Columbia have transit systems, regional differences cannot be accurately discussed. However, it is possible to comment on the national patterns that obtain. First, it is noticeable that very few places with populations less than 25 000 provide public transit to their residents. Quite likely, a certain size threshold must be reached before a public transit system is economically feasible. Smaller centres which cannot support a bus system often have alternative transit arrangements, such as shuttle taxi service (taxis which make multiple pick-up and delivery), vans, etc. Unfortunately, the service levels of such alternative arrangements are not reported to the Canadian Urban Transit Association.	It can also be noted that, whether a transit system is publicly or privately owned, it is related to the level of utilization. In general, privately owned systems have lower levels of utilization than publicly owned systems. Variations in transit utilization are also affected by site-specific circumstances. For example, Sydney reports extremely high ridership since it has special express commuter runs to the mines and steel mills which are used by a high proportion of the workers.

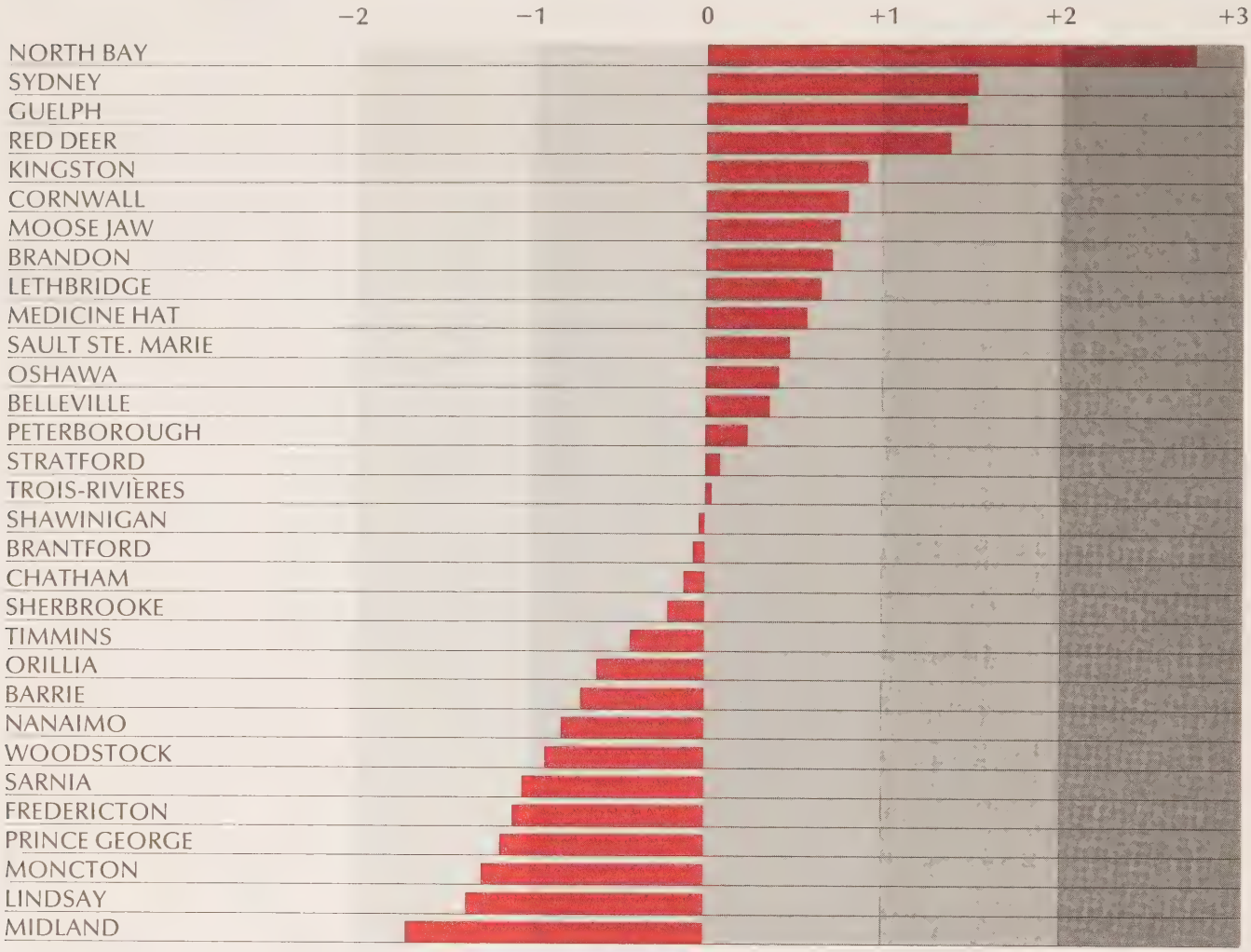
	a) Overall aggregate values	Public transportation (ridership): annual fare passengers carried per capita (1974)
	Mean ($\bar{X}$)	30.0
	Standard deviation (S)	14.8
	Maximum	70.7
	Minimum	4.1
OTHER MEASURES	If the focus is specifically on the demand side, much could be learned about the overall usefulness and the potential need for expansion of public transit if a profile of users could be developed. The types of questions such a profile should answer are as follows: (1) Who uses public transit and how often (children, elderly, housewives, students, the poor, etc.)? (2) Do users have access to a car? (3) What are the travel purposes of public transit users (e.g., work, shopping, social)? Answers to these questions can, in turn, be used to provide more specific indicators of the demand for public transit.	With regard to the supply of public transportation, measures such as those discussed as alternatives under the per capita vehicle kilometres measure are again relevant.

TABLE 18. PUBLIC TRANSPORTATION (RIDERSHIP): ANNUAL FARE PASSENGERS CARRIED PER CAPITA (1974)

ATLANTIC REGION	Fredericton*	13.6		
	Moncton*	10.8		
	Sydney*	52.0		
QUÉBEC REGION	Shawinigan*	30.1		
	Sherbrooke*	26.1		
	Trois-Rivières*	30.1		
ONTARIO REGION	Barrie*	19.3	North Bay	70.7
	Belleville	34.4	Orillia	20.7
	Brantford*	28.3	Oshawa*	35.4
	Chatham	26.5	Peterborough*	32.4
	Cornwall	41.1	Sarnia*	14.5
	Guelph*	50.1	Sault Ste. Marie*	35.7
	Kingston*	42.6	Stratford	30.5
	Lindsay	9.7	Timmins*	22.5
	Midland*	4.1	Woodstock	15.6
PRAIRIES REGION	Brandon	39.3	Moose Jaw	40.0
	Lethbridge	38.0	Red Deer	49.7
	Medicine Hat*	36.9		
BRITISH COLUMBIA REGION	Nanaimo*	17.1		
	Prince George*	12.1		

NOTES: 1971 boundaries are used for all urban areas. Places for which data are unavailable generally do not have a bus system. However, there are a few places that provide bus service for which information has not been received (e.g., Prince Albert).
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Data are derived from reports of the Canadian Urban Transit Association. Information is supplied to the Association by individual transit companies.

GRAPH 16. PUBLIC TRANSPORTATION (RIDERSHIP): ANNUAL FARE PASSENGERS CARRIED PER CAPITA (1974) (Z Scores)



PUBLIC TRANSPORTATION: SERVICE PROVIDED ANNUAL REVENUE VEHICLE KILOMETRES PER CAPITA (1974)

ASPECT MEASURED

The concern here is with the supply of public transit. The supply of public transit has a direct impact on the quality of life experienced by those without regular access to private means of transportation. For the young, the elderly, the poor and others who often do not have access to a private automobile, the availability of public transit provides a degree of independence which they would not otherwise have. Without public transit a significant number of residents may experience difficulty in obtaining goods and services and in participating in community activities. For those with private transportation, the availability of public transit provides a choice of means of travel. In some cases, public transit may, in fact, be viewed as a more desirable means of travel than the private automobile.

The measure reported is derived from data provided to the Canadian Urban Transit Association by individual transit companies. Put simply, the measure is constructed by dividing the total number of kilometres that all public transit vehicles travelled for revenue in 1974 by the city's population. The result is the annual revenue vehicle kilometres travelled per capita.

The number of kilometres travelled is a function of both the frequency of service and the number and length of routes. Thus, the more kilometres travelled the greater will be the supply of service in at least one of the above respects.

DIFFICULTIES OF INTERPRETATION

Because the accounting procedures of transit companies require data on revenue vehicle kilometres, this information is carefully collected and reported. As a consequence, it is possible to have a fair degree of confidence in the reliability of measures based on these data. Where difficulties arise is in attempts to use the measure to assess a specific aspect of the availability (supply) of service. Two communities may have similar scores in kilometres travelled by public transit but may vary significantly in the frequency of service, number of routes and area covered. For example, one community might run a small number of short routes with great frequency while another community, with the same score, has a large number of routes which are run at a low frequency.

URBAN PATTERN

It should be noted again that only the larger urban areas are able to support public transit systems. Interestingly, population size also appears to relate to the supply of service where transit systems exist. Larger cities, such as Oshawa, Sydney, Peterborough, Trois-Rivières and Brantford tend to have higher levels of service, while service levels are sharply curtailed in the smallest centres that have transit companies (e.g., Lindsay, Midland, Thetford Mines).

Special demands for service in some centres appear to relate to higher service levels. University towns with large student populations, such as Guelph and Kingston, tend to have relatively high levels of service. Higher levels of service are also found in centres such as Oshawa, Sydney and Sault Ste. Marie where the geographic concentration of major employers may make it more economical to provide transit service.

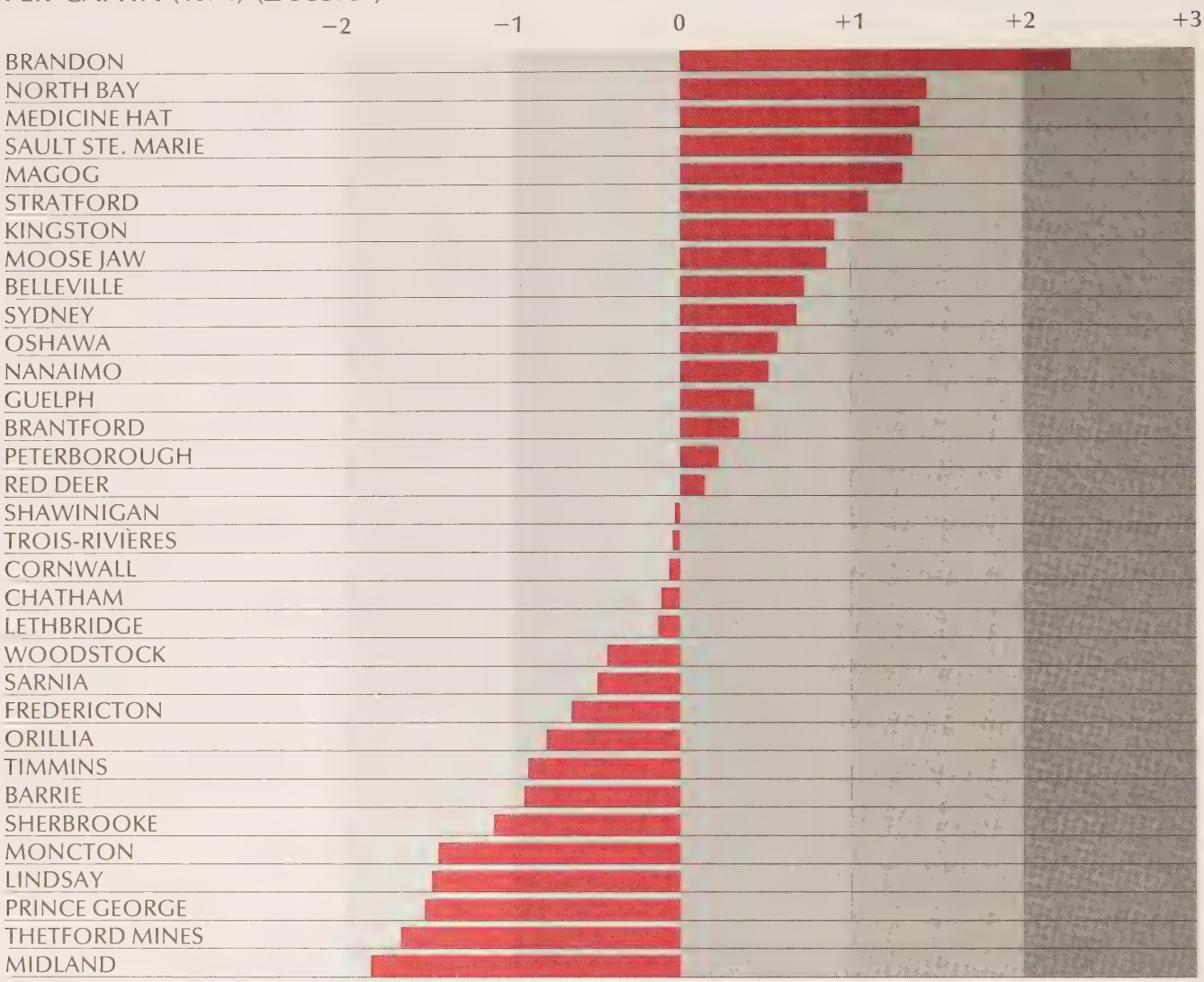
	a) Overall aggregate values	Public transportation: annual revenue vehicle kilometres per capita (1974)
	Mean ($\bar{X}$)	15.1
	Standard deviation (S)	6.0
	Maximum	28.0
	Minimum	4.7
OTHER MEASURES	Data from the Canadian Urban Transit Association can be used to provide a substantial number of measures that document particular aspects of transit service. Overall, however, none of these other potential measures reflects the service frequency or route length as well as revenue vehicle kilometres per capita. Examples of the alternatives include the following. "Revenue vehicle hours" provides the number of hours buses are in service, but gives no indication of route length. "Route kilometres offered" indicates extensiveness of bus routes but not frequency of service. "Number of seats" and "number of transit vehicles" can be used as measures of fleet size but not of service frequency or extensiveness of routes.	Ideally, other measures should be developed to indicate both supply and quality of service. Measures such as headway time on routes at given hours (i.e., the time it takes a vehicle to complete its route), the average distance from home to nearest transit stop and the riders' perceptions of the quality of the ride exemplify possible future indicators of these types.

TABLE 19. PUBLIC TRANSPORTATION: ANNUAL REVENUE VEHICLE KILOMETRES PER CAPITA (1974)

ATLANTIC REGION	Fredericton*	11.3		
	Moncton*	7.1		
	Sydney*	18.8		
QUÉBEC REGION	Magog*	22.4	Thetford Mines	5.6
	Shawinigan*	15.1	Trois-Rivières*	15.1
	Sherbrooke*	5.3		
ONTARIO REGION	Barrie*	9.5	North Bay	23.5
	Belleville	18.8	Orillia	10.5
	Brantford*	16.7	Oshawa*	18.0
	Chatham	14.5	Peterborough*	16.3
	Cornwall	14.8	Sarnia*	12.2
	Guelph*	17.1	Sault Ste Marie*	22.7
	Kingston*	20.1	Stratford	21.6
	Lindsay	6.9	Timmins*	9.5
	Midland*	4.7	Woodstock	12.6
PRAIRIES REGION	Brandon	28.0	Moose Jaw	19.6
	Lethbridge	14.5	Red Deer	15.8
	Medicine Hat*	23.0		
BRITISH COLUMBIA REGION	Nanaimo*	17.9		
	Prince George*	6.8		

NOTES: 1971 boundaries are used for all urban areas. Places for which data are unavailable generally do not have a bus system. However, there are a few places that provide bus service for which information has not been received (e.g., Prince Albert).
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Data are derived from reports of the Canadian Urban Transit Association. Information is supplied to the Association by individual transit companies.

GRAPH 17. PUBLIC TRANSPORTATION: ANNUAL REVENUE VEHICLE KILOMETRES PER CAPITA (1974) (Z Scores)



II SOCIAL DEVELOPMENT

EDUCATIONAL SERVICES

Education, which may be defined as formal training in the acquisition of knowledge and skills, is of vital concern to both individuals and society as a whole. At the individual level, education offers the opportunity to gain the knowledge and orientation which lead to self-development, expanded personal horizons and more responsible occupational positions. At the societal level, a well-educated population contributes to technological advance and economic progress, stimulates the evolution of cultural and social institutions and provides the basis for more effective public input to community life.

Accessibility to education and the quality of education provided are, therefore, seen as significant components of the quality of life. In this section, two educational measures are studied: Educational Achievement and Educational Service Levels (i.e., Pupil/Teacher Ratio).

EDUCATIONAL ACHIEVEMENT: PERCENTAGE AGED 20-34 WITH GRADE 10 OR LESS (1971)

ASPECT MEASURED

This indicator measures the proportion of people in each city who do not possess the usual educational requirements. Those without these educational levels are more likely to have difficulty in obtaining employment. Clearly, the higher the percentage, the lower the overall level of educational achievement in the community's population. The 20-34 age group is emphasized because these are the people who will not have the years of employment experience that might offset their lack of formal education.

Communities in which a large segment of the population has no more than Grade 10 education are more likely to experience an unemployment problem. A largely unskilled labour force makes a city less attractive to technologically sophisticated "growth" industries, thus reducing the centre to dependence on a decreasing number of low-wage, slow-growth industries (e.g., textiles, furniture). The economically depressed conditions that result are likely to be matched by a lack of cultural vibrance due to the relative inability of a less educated populace to participate fully in the arts and cultural life of their city. As a consequence, such communities will be unattractive to those who seek a city which is culturally lively.

DIFFICULTIES OF INTERPRETATION

It should be recognized that this measure of achievement focusses on formal schooling only. Knowledge and skills acquired through part-time schooling, apprenticeship, on-the-job training, correspondence courses, membership in voluntary associations, personal reading or parental guidance are not taken into account. Moreover, this crude "proxy" measure of educational output provides no indication of what is actually being learned as the student progresses through the educational system, thereby concealing whether students are more educated or have simply participated in the system longer. In order to monitor what has been learned, a nationwide program to test the literacy, mathematical ability and reading skills at different age levels would be needed. Nevertheless, the present measure provides a rough and ready educational profile of a community's young adult population.

Several technical points must also be noted. First, there is some problem of comparability between places because the terminal year of a high school program ranges from a low of Grade 11 (e.g., Newfoundland) to a high of Grade 13 (e.g., Ontario). Thus, Grade 10 represents slightly different levels of achievement in the educational system from province to province. Second, the reader should note that the Grade 10 cut-off refers to grade last *attended*, not necessarily the grade last *completed*.

URBAN PATTERN

Variations in the degree of educational achievement are quite pronounced for cities in different regions. As the descriptive statistics show, the proportion of a city's population having a relatively low level of educational attainment is generally large in the Québec region, about average in Ontario and the Maritimes, and small in the West. When the achievement levels are standardized and the scores ranked, the concentration of low levels of achievement in Québec communities becomes particularly noticeable. Of the 22 cities that have scores of +1.0 or higher, seventeen are located in Québec and three in eastern Ontario. In contrast, the fifteen centres having standardized scores of -1.0 or less include eight communities from British Columbia and four from the Prairies.

Variations in levels of schooling between cities correspond, in part, to the dominant economic functions performed by the respective communities. Higher proportions of the young adult population have completed not more than Grade 10 in centres that specialize in mining (Sydney Mines, Timmins, Asbestos, Val-d'Or) or in non-durable manufacturing such as textiles, clothing, food and beverages (Valleyfield, Victoriaville, Granby, Saint-Hyacinthe, Leamington). Conversely, far fewer people have low levels of educational achievement in cities that primarily perform wholesale/retail distribution functions (Lethbridge, Swift Current, Grande Prairie), education and public administration services (Fredericton, Kingston) or technologically sophisticated industrial processing (Sarnia, Trail). Hence, regional disparities in the economic base of communities are reflected by systematic regional differences in educational achievement.

a) Overall aggregate values	Educational achievement: percentage aged 20-34 with grade 10 or less (1971)
Mean ($\bar{X}$)	45.5
Standard deviation (S)	9.2
Maximum	67.0
Minimum	25.0
Range	42.0

b) By region	$\bar{X}$	S	N
Atlantic	46.7	6.2	17
Québec	54.4	5.8	30
Ontario	45.4	7.2	35
Prairies	35.9	6.0	13
British Columbia	36.4	6.0	17

OTHER MEASURES

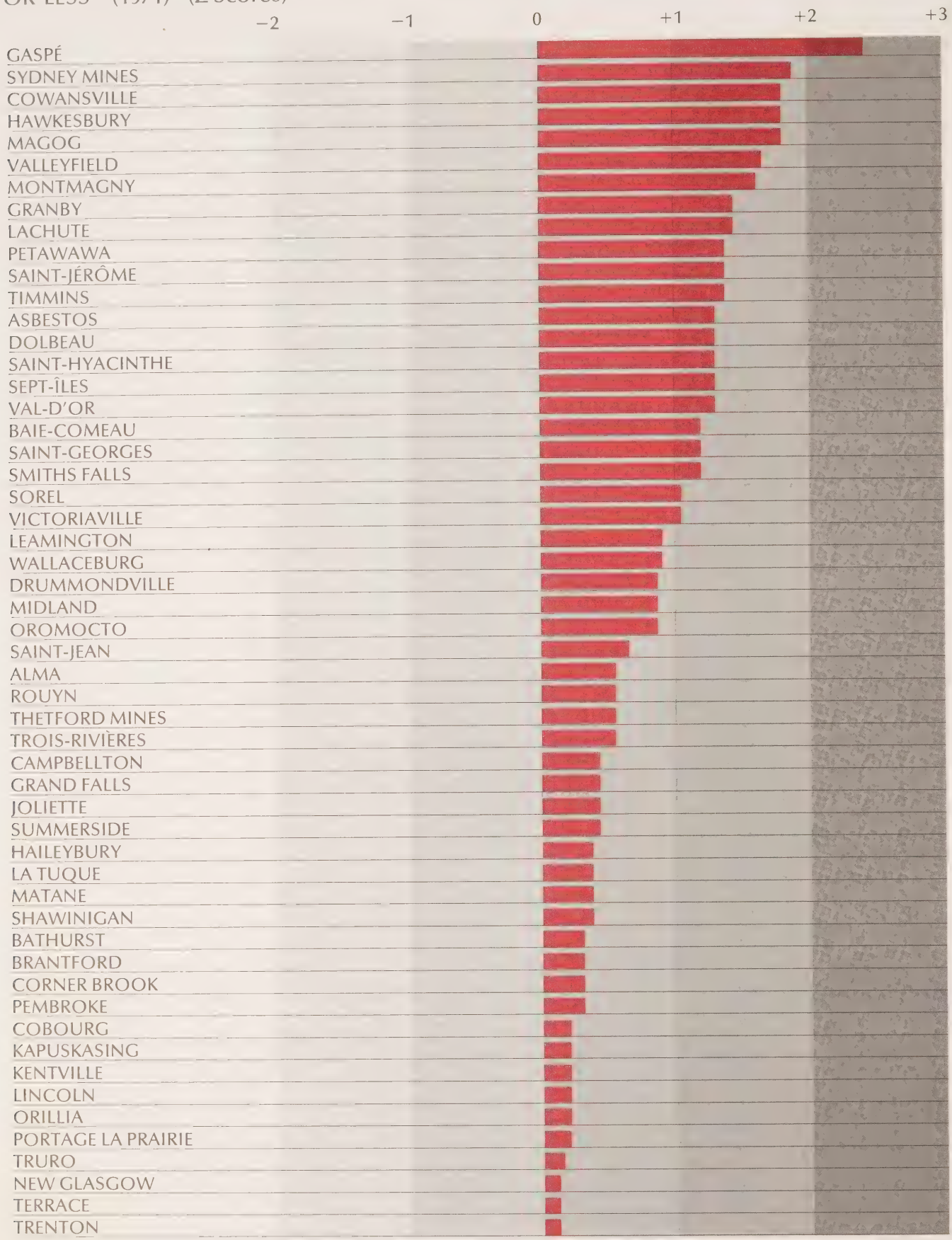
No totally satisfactory output measures have yet been devised for education, partly because benefits such as improvements in students' cognition, motor skills or personality development are particularly difficult to quantify at the national scale. In the absence of better measures, various "proxies" for educational output have been established. These include average number of years of education, university degrees received, licenses obtained and other "threshold crossing" measures. The distributional characteristics of educational achievement by socio-demographic group (sex, ethnicity, language) or socio-economic status (occupation, income) may also be investigated. As noted earlier, the most direct way of assessing actual skills developed within the educational system is periodically to measure students' performance by use of standardized tests of literacy, reading ability and the like. Unfortunately, data of this nature are not available on a nationwide basis.

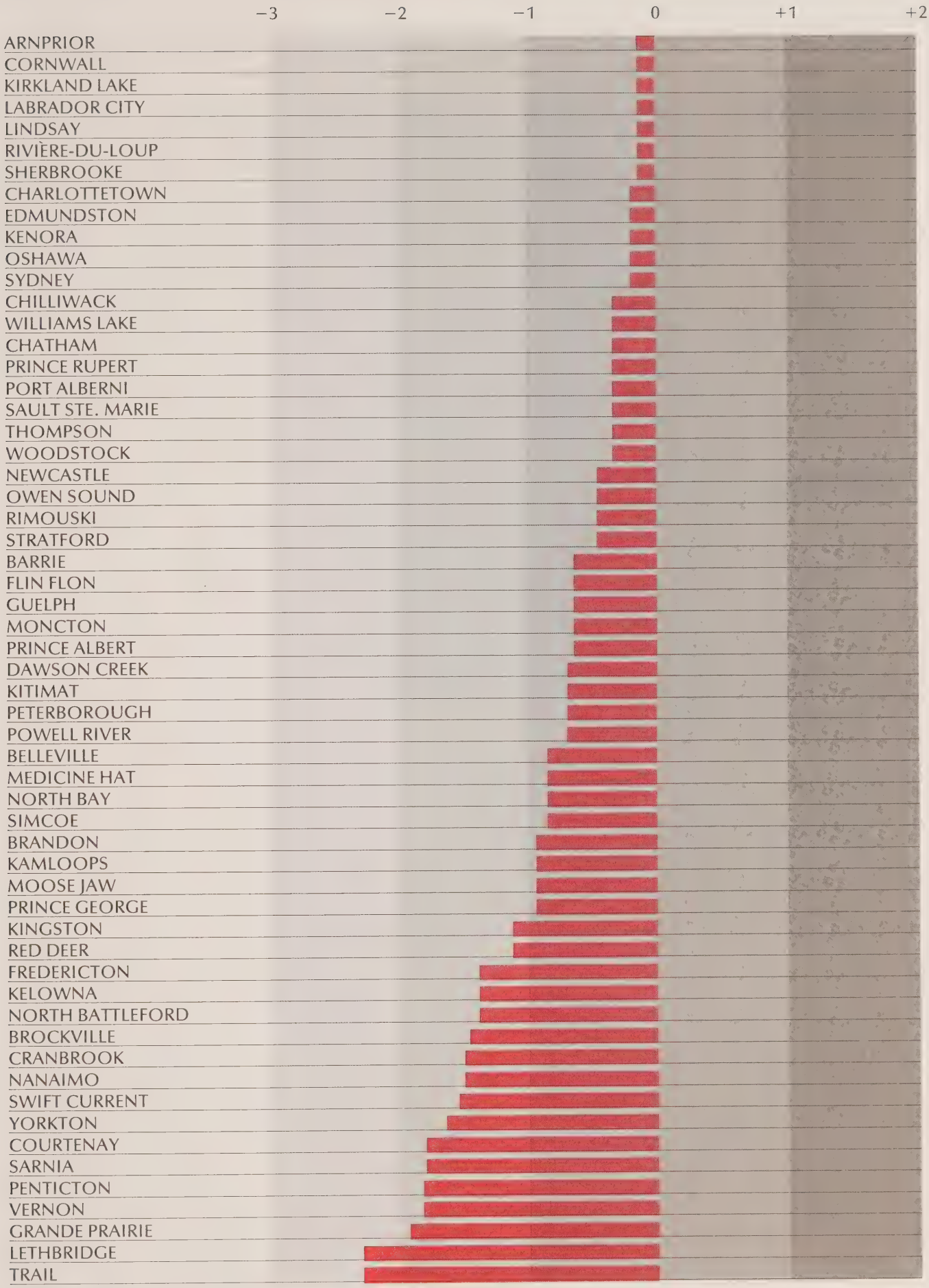
TABLE 20. EDUCATIONAL ACHIEVEMENT: PERCENTAGE AGED 20-34 WITH GRADE 10 OR LESS (1971)

ATLANTIC REGION	Bathurst	48	Moncton*	40
	Campbellton*	50	Newcastle*	41
	Charlottetown*	44	New Glasgow*	46
	Corner Brook	48	Oromocto	53
	Edmundston	44	Summerside*	50
	Fredericton*	34	Sydney*	44
	Grand Falls*	50	Sydney Mines*	63
	Kentville*	47	Truro*	47
	Labrador City*	45		
QUÉBEC REGION	Alma	51	Rivière-du-Loup	45
	Asbestos*	57	Rouyn*	51
	Baie-Comeau*	56	Saint-Georges*	56
	Cowansville	62	Saint-Hyacinthe*	57
	Dolbeau*	57	Saint-Jean*	52
	Drummondville*	53	Saint-Jérôme*	58
	Gaspé	67	Sept-Îles	57
	Granby*	59	Shawinigan*	49
	Joliette*	50	Sherbrooke*	45
	Lachute*	59	Sorel*	55
	La Tuque	49	Thetford Mines*	51
	Magog*	62	Trois-Rivières*	51
	Matane	49	Val-d'Or*	57
	Montmagny	60	Valleyfield*	61
	Rimouski*	41	Victoriaville*	55
ONTARIO REGION	Arnprior*	45	Midland*	53
	Barrie*	40	North Bay	38
	Belleville	38	Orillia	47
	Brantford*	48	Oshawa*	44
	Brockville	33	Owen Sound	41
	Chatham	42	Pembroke*	48
	Cobourg*	47	Petawawa*	58
	Cornwall	45	Peterborough*	39
	Guelph*	40	Sarnia*	30
	Haileybury*	49	Sault Ste. Marie*	42
	Hawkesbury*	62	Simcoe	38
	Kapuskasing	47	Smiths Falls*	56
	Kenora*	44	Stratford	41
	Kingston*	36	Timmins*	58
	Kirkland Lake	45	Trenton*	46
	Leamington	54	Wallaceburg	54
	Lincoln	47	Woodstock	42
	Lindsay	45		
PRAIRIES REGION	Brandon	37	Portage la Prairie	47
	Flin Flon*	40	Prince Albert	40
	Grande Prairie	28	Red Deer	36
	Lethbridge	25	Swift Current	32
	Medicine Hat*	38	Thompson	42
	Moose Jaw	37	Yorkton	31
	North Battleford*	34		
BRITISH COLUMBIA REGION	Chilliwack*	43	Port Alberni*	42
	Courtenay*	30	Powell River	39
	Cranbrook	33	Prince George*	37
	Dawson Creek	39	Prince Rupert*	42
	Kamloops*	37	Terrace*	46
	Kelowna*	34	Trail*	25
	Kitimat	39	Vernon	29
	Nanaimo*	33	Williams Lake*	43
	Penticton	29		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Statistics Canada, *1971 Census of Canada*, special tabulation (Ottawa: May 1977).

GRAPH 18. EDUCATIONAL ACHIEVEMENT: PERCENTAGE AGED 20-34 WITH GRADE 10 OR LESS (1971) (Z Scores)




−3
−2
−1
0
+1
+2
ARNPRIOR
CORNWALL
KIRKLAND LAKE
LABRADOR CITY
LINDSAY
RIVIÈRE-DU-LOUP
SHERBROOKE
CHARLOTTETOWN
EDMUNDSTON
KENORA
OSHAWA
SYDNEY
CHILLIWACK
WILLIAMS LAKE
CHATHAM
PRINCE RUPERT
PORT ALBERNI
SAULT STE. MARIE
THOMPSON
WOODSTOCK
NEWCASTLE
OWEN SOUND
RIMOUSKI
STRATFORD
BARRIE
FLIN FLON
GUELPH
MONCTON
PRINCE ALBERT
DAWSON CREEK
KITIMAT
PETERBOROUGH
POWELL RIVER
BELLEVILLE
MEDICINE HAT
NORTH BAY
SIMCOE
BRANDON
KAMLOOPS
MOOSE JAW
PRINCE GEORGE
KINGSTON
RED DEER
FREDERICTON
KELOWNA
NORTH BATTLEFORD
BROCKVILLE
CRANBROOK
NANAIMO
SWIFT CURRENT
YORKTON
COURTENAY
SARNIA
PENTICTON
VERNON
GRANDE PRAIRIE
LETHBRIDGE
TRAIL

EDUCATIONAL SERVICE LEVELS: PUPIL/TEACHER RATIO (ELEMENTARY AND SECONDARY) (1974-75)

ASPECT MEASURED	Pupil/teacher ratio is a crude surrogate for a host of inputs influencing the level of educational service provided to students. To a certain extent, it is probable that the lower the pupil/teacher ratio, the higher the quality of the student's educational experience. Other things being equal, the smaller the class the more time the teacher will be able to devote to lesson preparation, assistance of students on an individual basis, identification of individual learning problems and evaluation of student performance. Also, a lower number of pupils per teacher in a community's school system may indicate the provision of more specialist teachers who provide remedial help (e.g., reading) or cultivate special interests (e.g., music, metal working).	The measure is derived by dividing the full-time student enrolment by the school-based teaching staff. School-based teachers counted would include classroom teachers, specialists in the schools, vice-principals and principals. Omitted from the calculation are supply teachers, specialists outside the schools, inspectors and other Board of Education administrators. Coverage encompasses the elementary and secondary levels for both the public and separate systems. Excluded from consideration were private and specialist schools. The pupil/teacher ratio reads "the number of pupils per teacher".
DIFFICULTIES OF INTERPRETATION	The indicator should be interpreted with caution. The measure provides a parameter of educational service levels, but says relatively little about the quality of education that students receive. Many other factors can influence the quality of a student's education, including differences in the professional qualifications and experience of the teacher, and variations in the quality of physical facilities, curriculum design and specialized programs, as well as the student's home environment.	

URBAN PATTERN

Only minor differences in the regional averages are apparent. Overall variation in the pupil/teacher ratio among medium-sized cities is small, as evidenced by the extremely low coefficient of variation ($(S/\bar{X}) = (1.5/19.5) - 0.07$). However, despite such small differences, it should be noted that the financial implications arising from slight changes in the pupil/teacher ratio are not insignificant to large municipal school systems. Nevertheless, the results suggest that, on average, class sizes in the school systems of most centres would fall within the range of 18 to 24 students per class, suggested as optimal in one recent empirical study of Canadian schools that statistically related classroom and teacher characteristics to student performance.[1]

a) Overall aggregate values	Pupil/teacher ratio: elementary and secondary schools (1974-75)
Mean ($\bar{X}$)	19.5
Standard deviation (S)	1.5
Maximum	22.5
Minimum	15.3
Range	7.2

b) By region	$\bar{X}$	S	N
Atlantic	19.5	2.0	16
Québec	*	*	*
Ontario	19.1	1.5	35
Prairies	19.8	0.6	13
British Columbia	19.9	1.0	17

* Data are not available for communities in Québec

[1] J. Greenberg, *Social Indicators in Education: A Case Study* (Ottawa: Economic Council of Canada, Discussion Paper No. 15, 1974).

OTHER MEASURES

If comparable figures on education inputs are to be derived for a full range of urban places, then information may be obtained from provincial administrative records or the Education, Science and Culture Division, Statistics Canada. Although this information is available for most school systems, its content is limited to a profile of teacher characteristics and to tabulations of equipment, classrooms and other infrastructure. The usefulness of such input measures can be greatly enhanced if they are complemented by detailed surveys of a relatively small number of classrooms and schools so as to calibrate the degree to which certain factors impinge upon a student's educational progress.

As an example, the Economic Council of Canada has statistically analyzed the strength of the impact exerted on the student's level of academic achievement and degree of interest by various sets of inputs, including teacher attributes, class size, peer-group influence, socio-economic background of students and personal characteristics of students.[2] Some of the measures tested were the age, experience, workload and academic qualifications of teachers, the socio-demographic profile of parents, the size of the home library and parental aspirations. The studies concluded that, among other factors, the age and professional experience of teachers, the size of class, peer-group influence and the educational level of the father strongly affected student interest and performance.

Earlier Canadian studies found that the number of students in a particular school who had passed all their high school years to date was significantly related to family characteristics, parents' education and teacher workload.[3] The findings further showed that the proportion of students who planned to complete high school varied significantly with parental aspirations, family characteristics, the overall educational level of the community and the quality of library facilities. Although the study was not exhaustive, it served to suggest that the family and social environment external to the school system may influence student performance and aspirations to the same extent as inputs internal to the educational system. If so, then indicators of educational inputs must extend beyond the formal educational process and focus on relevant facets of a community's social profile.

[2]J. Greenberg, *Social Indicators in Education: A Conceptual Framework* (Ottawa: Economic Council of Canada, Discussion Paper No. 6, 1974); J. Greenberg, *Social Indicators in Education: A Case Study* (Ottawa: Economic Council of Canada, Discussion Paper No. 15, 1974); J.C.R. Rowley and N. Leckie, *A Further Look at the Determinants of Educational Achievement* (Ottawa: Economic Council of Canada, Discussion Paper No. 60, 1976).

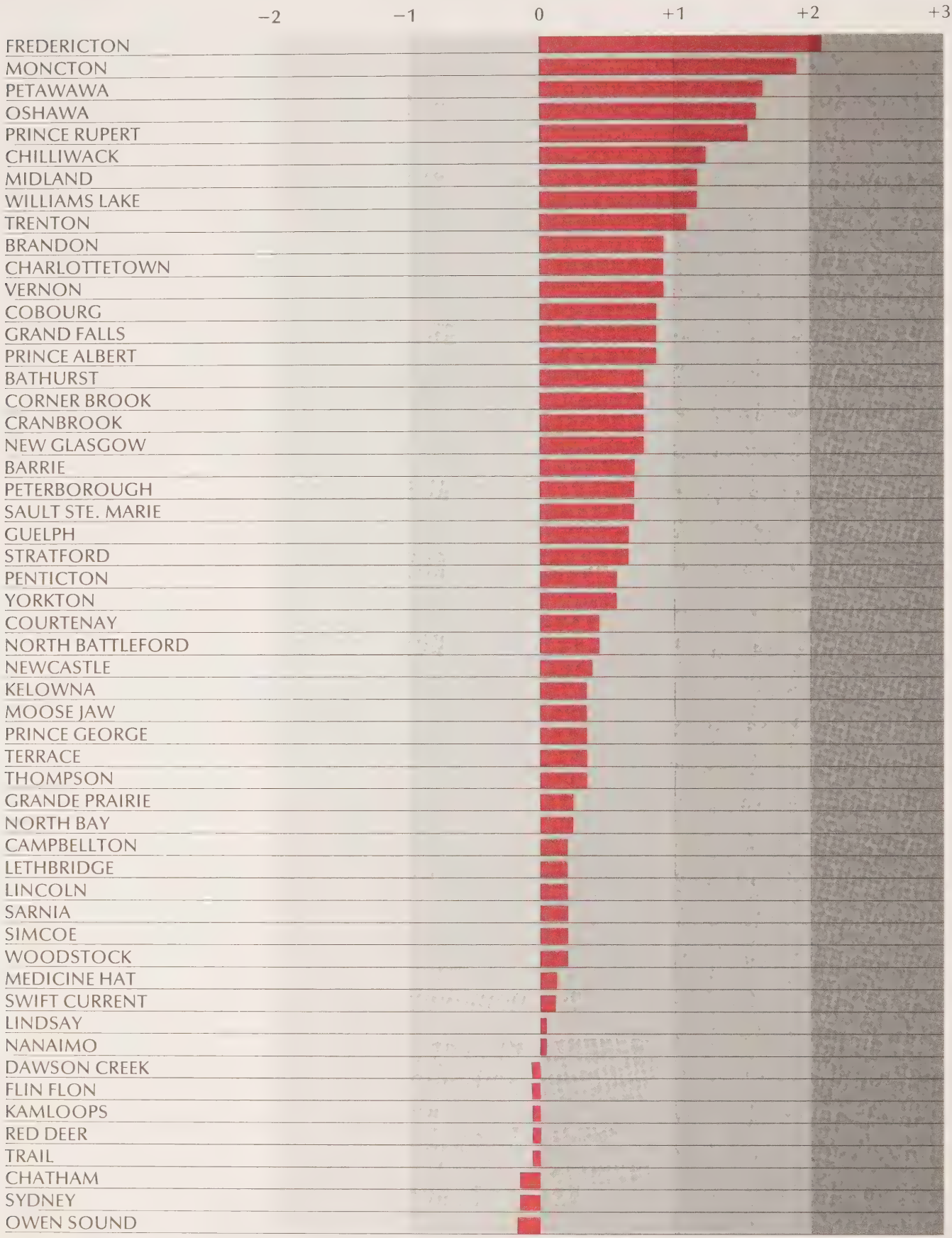
[3]Economic Council of Canada, *Eighth Annual Review: Design For Decisionmaking: An Application to Human Resource Policies* (Ottawa: Information Canada, 1971), pp. 195-224.

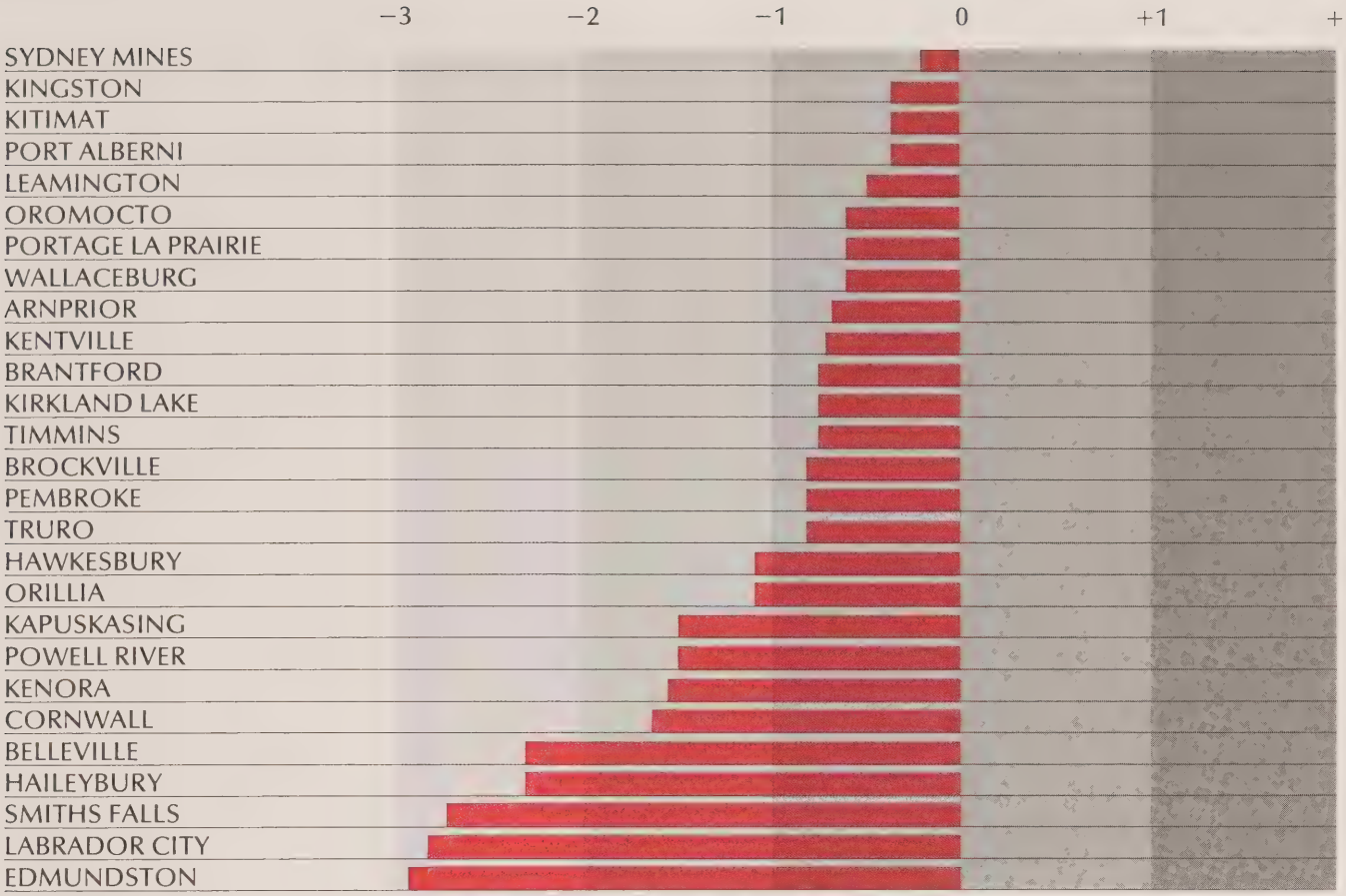
TABLE 21: PUPIL/TEACHER RATIO: ELEMENTARY AND SECONDARY SCHOOLS (1974-1975)

ATLANTIC REGION	Bathurst	20.6	Moncton*	22.2
	Campbellton*	19.7	Newcastle*	20.0
	Charlottetown*	20.8	New Glasgow*	20.6
	Corner Brook	20.6	Oromocto	18.7
	Edmundston	15.3	Summerside*	+
	Fredericton*	22.5	Sydney*	19.3
	Grand Falls*	20.7	Sydney Mines*	19.2
	Kentville*	18.5	Truro*	18.3
	Labrador City*	15.5		
ONTARIO REGION	Arnprior*	18.6	Midland*	21.1
	Barrie*	20.5	North Bay	19.8
	Belleville	16.2	Orillia	18.0
	Brantford*	18.4	Oshawa*	21.8
	Brockville	18.3	Owen Sound	19.2
	Chatham	19.3	Pembroke*	18.3
	Cobourg*	20.7	Petawawa*	21.9
	Cornwall	17.2	Peterborough*	20.5
	Guelph*	20.4	Sarnia*	19.7
	Haileybury*	16.2	Sault Ste. Marie*	20.5
	Hawkesbury*	18.0	Simcoe	19.7
	Kapuskasing	17.5	Smiths Falls*	15.6
	Kenora*	17.4	Stratford	20.4
	Kingston*	19.0	Timmins*	18.4
	Kirkland Lake	18.4	Trenton*	21.0
	Leamington	18.8	Wallaceburg	18.7
	Lincoln	19.7	Woodstock	19.7
	Lindsay	19.5		
PRAIRIES REGION	Brandon	20.8	Portage la Prairie	18.7
	Flin Flon*	19.4	Prince Albert	20.7
	Grande Prairie	19.8	Red Deer	19.4
	Lethbridge	19.7	Swift Current	19.6
	Medicine Hat*	19.6	Thompson	19.9
	Moose Jaw	19.9	Yorkton	20.3
	North Battleford*	20.2		
BRITISH COLUMBIA REGION	Chilliwack*	21.3	Port Alberni*	19.0
	Courtenay*	20.2	Powell River	17.5
	Cranbrook	20.6	Prince George*	19.9
	Dawson Creek	19.4	Prince Rupert*	21.7
	Kamloops*	19.4	Terrace*	19.9
	Kelowna*	19.9	Trail*	19.4
	Kitimat	19.0	Vernon	20.8
	Nanaimo*	19.5	Williams Lake*	21.1
	Penticton	20.3		

NOTES: 1971 boundaries are used for all urban areas.
Data not available for communities in Québec.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Derived from data submitted by the provincial Departments of Education and compiled by the Department of Regional Economic Expansion (DREE), Economic Development Analysis Division, Data Coordination Unit, Ottawa, 1977.

GRAPH 19. PUPIL/TEACHER RATIO: ELEMENTARY AND SECONDARY SCHOOLS (1974-75)
(Z Scores)

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SYDNEY MINES
KINGSTON
KITIMAT
PORT ALBERNI
LEAMINGTON
OROMOCTO
PORTAGE LA PRAIRIE
WALLACEBURG
ARNPRIOR
KENTVILLE
BRANTFORD
KIRKLAND LAKE
TIMMINS
BROCKVILLE
PEMBROKE
TRURO
HAWKESBURY
ORILLIA
KAPUSKASING
POWELL RIVER
KENORA
CORNWALL
BELLEVILLE
HAILEYBURY
SMITHS FALLS
LABRADOR CITY
EDMUNDSTON

HEALTH: FACILITIES, SERVICES AND CONDITIONS

The state of an individual's health is a central factor influencing the quality of life. Among other things, poor health may limit individuals' ability to make use of recreational and cultural facilities, their participation in the labour force or even their ability to take advantage of educational opportunities afforded in their community. In turn the availability of health care facilities affect the likelihood of preventing and curing ill-health.

The level of health in a community is a function of numerous factors ranging from the quality of the natural environment (e.g., air pollution, water pollution) to human life-styles. In this section, most of the attention is focussed on one of the most central factors affecting health, the availability of medical facilities and services. The universal importance of medical facilities and services for maintenance of good health in all urban communities, coupled with the fact that the supply of such facilities and services is subject to change via governmental policy decisions, makes this a reasonable focus for the development of urban health indicators.

Ideally, it would be desirable to include both measures of "output", which indicate the actual state of health of residents in urban centres, and measures of "input", such as physicians and hospitals available. Toward this end, we include infant mortality as an indicator of the level of health (output measure), supply of hospital beds and of general medical practitioners (input measures).

All of the measures utilized in this section have limitations which will be noted in the following pages. However, it is useful to identify here some of the shared problems of interpretation which beset our indicators of facilities and services. The two indicators of the availability of medical facilities and services presented involve problems of interpretation stemming from the fact that all of the population which uses a community's medical facilities and services does not necessarily reside within the community. When a centre is located near a CMA, it is possible that the indicators will under-estimate the accessibility of medical facilities and services in that a number of the centre's residents may make use of facilities and services in the CMA. On the other hand, when a community services a large rural population in addition to its own residents, the input measures are likely to over-estimate the availability of medical facilities and services to the population residing within the community.

In addition to this catchment area problem, the measures are also limited in that they do not measure the quality of facilities or services available.

Despite such limitations, the three measures do provide relevant indicators of health care conditions for the community.

HOSPITAL BEDS PER 1000 POPULATION (1976)

ASPECT MEASURED

The accessibility of medical facilities and services can be seen as an important factor affecting health. One way to indicate accessibility is to calculate the ratio of a city's hospital beds to its population. In using this ratio as indicative of accessibility, it is necessary to make the reasonable assumption that increases in the ratio of beds to population are generally accompanied by increases in other medical facilities and services.

The ratio used here gives the rated bed capacity of a city's hospitals which provide "fundamental" medical care (i.e., general, extended care, orthopaedic, rehabilitation, maternity and pediatric) per 1000 population.[4] Specialized facilities such as nursing homes, homes for the handicapped, the deaf and other specific client groups are excluded.

DIFFICULTIES OF INTERPRETATION

Rated bed capacity refers to the number of beds, cribs and bassinets a hospital is approved to have, given the available floor space, and not to the actual number of beds. Although the rated capacity and actual beds set up are usually similar, both over- and under-estimation of actual beds is possible. There is a tendency to overestimate the number of beds available for "fundamental" care in that some hospitals classified as providing general care sometimes contain sections with beds devoted to special care (e.g., tuberculosis, psychiatric ward).

Finally, the measure says nothing about the quality of services and facilities or about medical services which are not related to in-hospital care (such as, outpatient, emergency and diagnostic services).

URBAN PATTERN

There is relatively little variation in the ratio of beds to population across regions. Average city ratios range from a high of 13 beds per 1000 population in the Prairies to a low of 10 per 1000 in British Columbia. Cities in the Atlantic Region, Québec and Ontario fall in between with average ratios of 12, 12 and 11 beds per 1000 population, respectively.

Within regions, the greatest variations in city ratios occur in Québec where the standard deviation of ratios around the regional mean for cities is 6. In comparison, city ratios in the Atlantic Region have a standard deviation of 5, while in Ontario, British Columbia and the Prairies, the standard deviation is 4.

Across all regions, lower bed ratios tend to be found in resource towns located in remote areas (e.g., Labrador City, Val-d'Or, Sept-Îles, Timmins, Thompson) or in centres located relatively close to a CMA (e.g., Valleyfield, Saint-Jean, Granby, Nanaimo, Port Alberni).

High bed ratios show some tendency to be found in cities which serve as regional service centres. Extremely high ratios found in Campbellton, Rivière-du-Loup and Swift Current can be seen to be the result of the presence of provincial hospitals which service populations well beyond the city boundaries.

Finally, it should be noted that the bed ratio is significantly correlated with a number of other indicators examined in this publication. As would be expected, the bed ratio is positively correlated with the other health input measures (such as general practitioners per 1000). Also in line with expectations is the fact that the health output measure, infant mortality rates, tends to be lower in centres where bed ratios are higher.

[4]Statistics Canada, *Canadian Hospitals and Related Facilities*, Cat. 83-201 (Ottawa: 1976), Annual.

When variables other than health indicators are examined, the old age dependency ratio is found to be positively associated with the bed ratio, perhaps suggesting that the supply of beds has been increased to meet the medical needs of the elderly or that the elderly tend to move to communities where the availability of medical facilities is relatively high. More surprising than this correlation are those obtained between the bed ratios and population variables. Briefly, it is found that community bed ratios tend to be lower in communities with large populations and in communities which have experienced significant increases in population. The first of these relationships is probably best explained as being a result of larger centres providing services to residents of surrounding areas. On the other hand, the association between population growth and low bed ratios may be due to temporary lags in the development of community services. As time passes and population growth slows, the supply of the health services may catch up with the need for service.

a) Overall aggregate values

	Hospital beds per 1000 population (1976)
Mean ($\bar{X}$)	11.0
Standard deviation (S)	5.0
Maximum	26.0
Minimum	3.0

b) By region

	$\bar{X}$	S	N
Atlantic	12.0	5.0	17
Québec	12.0	6.0	30
Ontario	11.0	4.0	33
Prairies	13.0	4.0	13
British Columbia	10.0	4.0	17

OTHER MEASURES

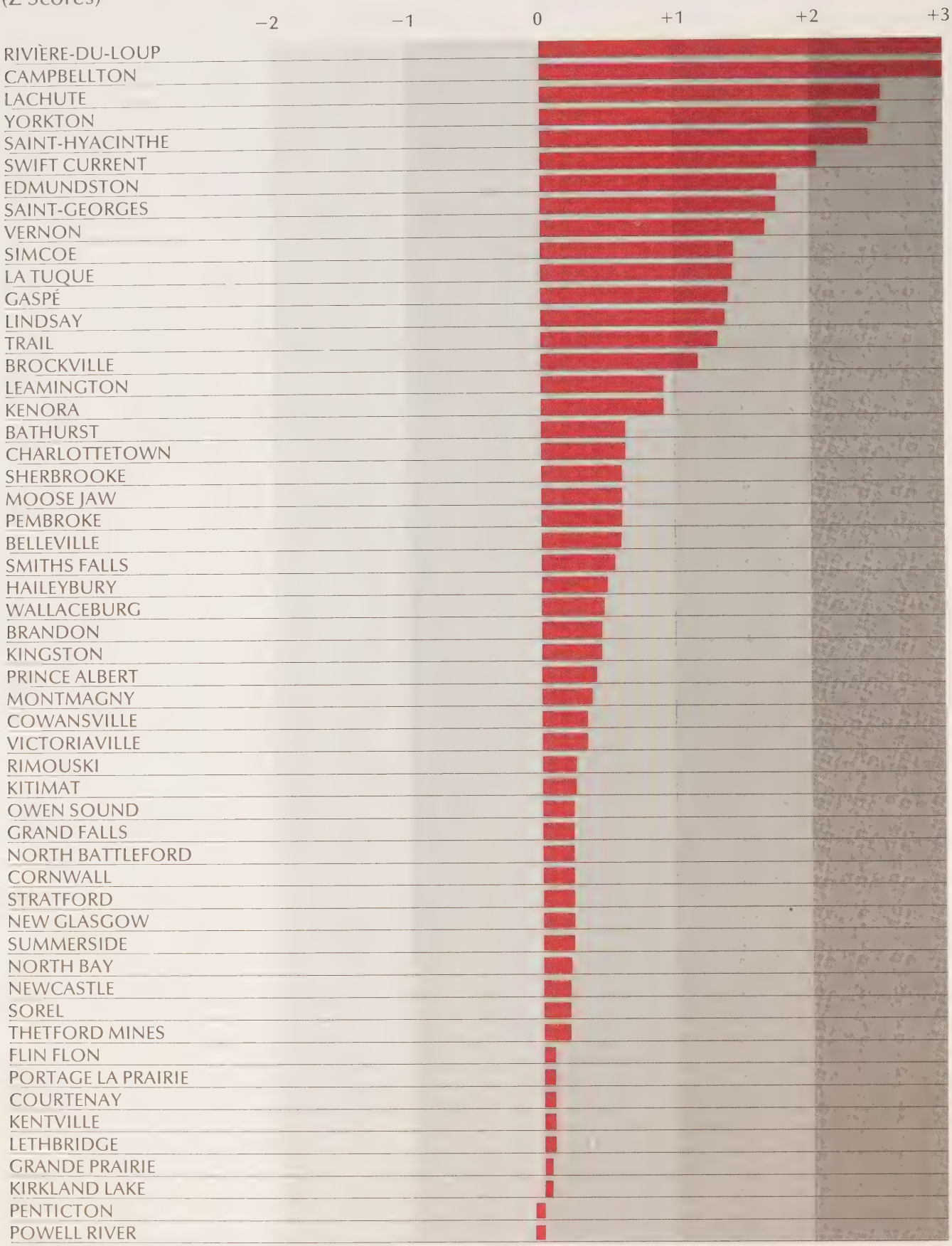
Alternative measures include: (1) per capita hospital expenditures; (2) number of unoccupied hospital beds per 1000 population; (3) average waiting time for surgery; and (4) average waiting time for emergency treatment; (5) bed capacity in special care facilities (e.g., nursing homes, chronic care units). Each of these provides an aspect of health care service in the community.

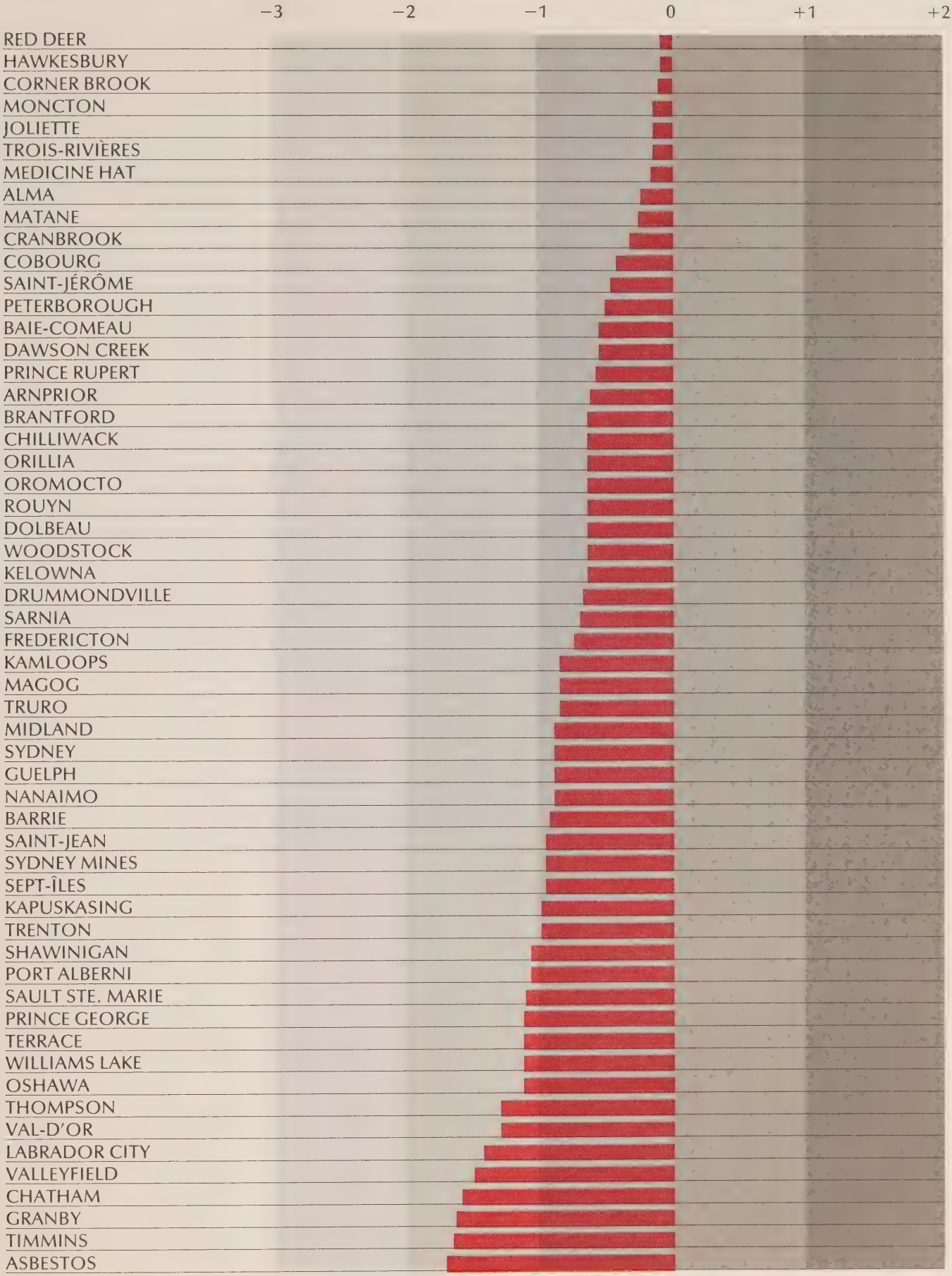
TABLE 22. HOSPITAL BEDS: RATED CAPACITY PER 1000 POPULATION (1976)

ATLANTIC REGION	Bathurst	15	Moncton*	11
	Campbellton*	26	Newcastle*	12
	Charlottetown*	15	New Glasgow*	12
	Corner Brook	11	Oromocto	9
	Edmundston	18	Summerside*	12
	Fredericton*	8	Sydney*	7
	Grand Falls*	12	Sydney Mines*	7
	Kentville*	12	Truro*	7
	Labrador City*	5		
QUÉBEC REGION	Alma	10	Rivière-du-Loup	26
	Asbestos*	3	Rouyn*	9
	Baie-Comeau*	9	Saint-Georges*	20
	Cowansville	13	Saint-Hyacinthe*	22
	Dolbeau*	8	Saint-Jean*	7
	Drummondville*	8	Saint-Jérôme*	10
	Gaspé	18	Sept-Îles	7
	Granby*	4	Shawinigan*	6
	Joliette*	11	Sherbrooke*	15
	Lachute*	23	Sorel*	12
	La Tuque	18	Thetford Mines*	12
	Magog*	8	Trois-Rivières*	10
	Matane	10	Val-d'Or*	5
	Montmagny	13	Valleyfield*	4
	Rimouski*	12	Victoriaville*	13
ONTARIO REGION	Arnprior*	9	Midland*	7
	Barrie*	7	North Bay	12
	Belleville	14	Orillia	9
	Brantford*	9	Oshawa*	6
	Brockville	17	Owen Sound	12
	Chatham	4	Pembroke*	14
	Cobourg*	10	Petawawa*	+
	Cornwall	12	Peterborough*	10
	Guelph*	7	Sarnia*	8
	Haileybury*	14	Sault Ste. Marie*	6
	Hawkesbury*	11	Simcoe	19
	Kapuskasing	7	Smiths Falls*	14
	Kenora*	16	Stratford	12
	Kingston*	11	Timmins*	4
	Kirkland Lake	11	Trenton*	7
	Leamington	16	Wallaceburg	13
	Lincoln	+	Woodstock	8
	Lindsay	17		
PRAIRIES REGION	Brandon	13	Portage la Prairie	12
	Flin Flon*	12	Prince Albert	13
	Grande Prairie	12	Red Deer	11
	Lethbridge	12	Swift Current	21
	Medicine Hat*	10	Thompson	6
	Moose Jaw	14	Yorkton	23
	North Battleford*	12		
BRITISH COLUMBIA REGION	Chilliwack*	9	Port Alberni*	6
	Courtenay*	12	Powell River	11
	Cranbrook	10	Prince George*	6
	Dawson Creek	9	Prince Rupert*	9
	Kamloops*	8	Terrace*	6
	Kelowna*	8	Trail*	17
	Kitimat	12	Vernon	15
	Nanaimo*	7	Williams Lake*	6
	Penticton	11		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Statistics Canada, *Canadian Hospitals and Related Facilities*, Cat. 83-201 (Ottawa: 1976), Annual.

GRAPH 20. HOSPITAL BEDS: RATED CAPACITY PER 1000 POPULATION (1976)
(Z Scores)

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RED DEER
HAWKESBURY
CORNER BROOK
MONCTON
JOLIETTE
TROIS-RIVIÈRES
MEDICINE HAT
ALMA
MATANE
CRANBROOK
COBOURG
SAINT-JÉRÔME
PETERBOROUGH
BAIE-COMEAU
DAWSON CREEK
PRINCE RUPERT
ARNPRIOR
BRANTFORD
CHILLIWACK
ORILLIA
OROMOCTO
ROUYN
DOLBEAU
WOODSTOCK
KELOWNA
DRUMMONDVILLE
SARNIA
FREDERICTON
KAMLOOPS
MAGOG
TRURO
MIDLAND
SYDNEY
GUELPH
NANAIMO
BARRIE
SAINT-JEAN
SYDNEY MINES
SEPT-ÎLES
KAPUSKASING
TRENTON
SHAWINIGAN
PORT ALBERNI
SAULT STE. MARIE
PRINCE GEORGE
TERRACE
WILLIAMS LAKE
OSHAWA
THOMPSON
VAL-D'OR
LABRADOR CITY
VALLEYFIELD
CHATHAM
GRANBY
TIMMINS
ASBESTOS

GENERAL PRACTITIONERS PER 1000 POPULATION (1975)

ASPECT MEASURED	Just as the availability of medical facilities is an important factor affecting the quality of a community's health, so too is the availability of competent medical service. While a variety of people are involved in the delivery of medical and health care services, the cornerstone of the Canadian system is the general practitioner. In most cases, it is the general practitioner who does the initial diagnosis, provides treatment and makes referrals. As a minimum, it can be assumed that the probability of having access to reliable medical services increases with a rise in the ratio of general practitioners to community population totals.	Here, the number of general practitioners per 1000 population is taken as an indicator of the accessibility of adequate medical service. The measure was derived from data in the DREE Community Infrastructure Data Bank. DREE obtained a list of mailing addresses of registered physicians from Southam Business Services. Postal Codes were then used to allocate physicians to communities.
DIFFICULTIES OF INTERPRETATION	A number of unique problems of interpretation arise from the use of the general practitioner ratio. First, because interns and military doctors are not included in the count of general practitioners, the ratio may tend to underestimate the accessibility of service. Second, some general practitioners may be heavily involved in research, administration and/or teaching, and thus have limited time to service patients directly. Third, travelling doctors who provide regular service to a number of	communities are not accounted for in the measure. Also, in some communities, competent medical service may be provided by registered nurses, paramedics and others who are not general practitioners. Finally, the measure may slightly underestimate the availability of general practitioners in that doctors whose mailing addresses were incomplete (i.e., did not have a postal code) could not be allocated to communities.

Comparison of regions shows average, city general practitioner ratios to range from a high of 1.6 in the Prairies to a low of .07 in Québec.[5] The Altantic Region, Ontario and British Columbia fall in between these extremes with respective ratios of 1.3, 1.2 and 1.2.

Within regions, the greatest variation in city general practitioner ratios is found in the Atlantic Region with a standard deviation of .6 from the regional average. Other standard deviation scores are .5 for the Prairies, .4 for Ontario, .3 for British Columbia and .2 for Québec. Taken together, the standard deviation scores and the average, city general practitioner ratios within regions suggest that communities in Québec generally have low ratios while communities in the Atlantic Region vary significantly in their general practitioner ratios.

Nationally, higher ratios tend to be found in cities which serve as regional service centres (e.g., North Battleford, Rivière-du-Loup, Campbellton). Low ratios tend to occur in remote resource towns (e.g., Labrador City, Sept-Îles, Prince George) and to centres located relatively close to a CMA (e.g., Lincoln, Valleyfield, Saint-Jean).

Further examination of the general practitioner ratio reveals it to be positively correlated with the number of hospital beds per 1000 population and with old age dependency ratios. On the other hand, it is negatively correlated with low educational achievement in the city's population.

The positive correlations of general practitioner ratio with hospital bed ratios and the old age dependency ratio are to be expected since doctors need medical facilities and facilities are typically of limited utility without doctors. Elderly people are likely to move in order to be close to both medical facilities and services, and more services are likely to be provided for high concentrations of elderly people who tend to have more need for health services than do young people. The correlation between the general practitioner ratio and the educational achievement measure suggests that, as the education attainment level of the community increases, so too does the availability of general practitioners. In part, this association may be due to the tendency for higher education attainment levels to be found in communities with a more developed and diversified economy and to the fact that such communities are more likely to be able to afford medical facilities that attract doctors.

[5]If the provincial ratios of physicians to population are examined, Québec is seen to have the fourth "best" ratio among the ten provinces in 1971 (Perspective Canada 1977), perhaps suggesting a problem of under-reporting.

a) Overall aggregate value	General practitioners per 1000 population (1975)		
Mean ($\bar{X}$)	1.1		
Standard deviation(S)	0.5		
Maximum	2.9		
Minimum	0.2		
b) By region	$\bar{X}$	S	N
Atlantic	1.3	0.6	17
Québec	0.7	0.2	30
Ontario	1.2	0.4	35
Prairies	1.6	0.5	13
British Columbia	1.3	0.3	17

OTHER MEASURES

A more direct measure of the accessibility of medical services would undoubtedly be desirable. Unfortunately, measures which might be considered more direct, such as the waiting time to see a doctor, waiting time for surgery or average waiting time for emergency treatment, are difficult to obtain.

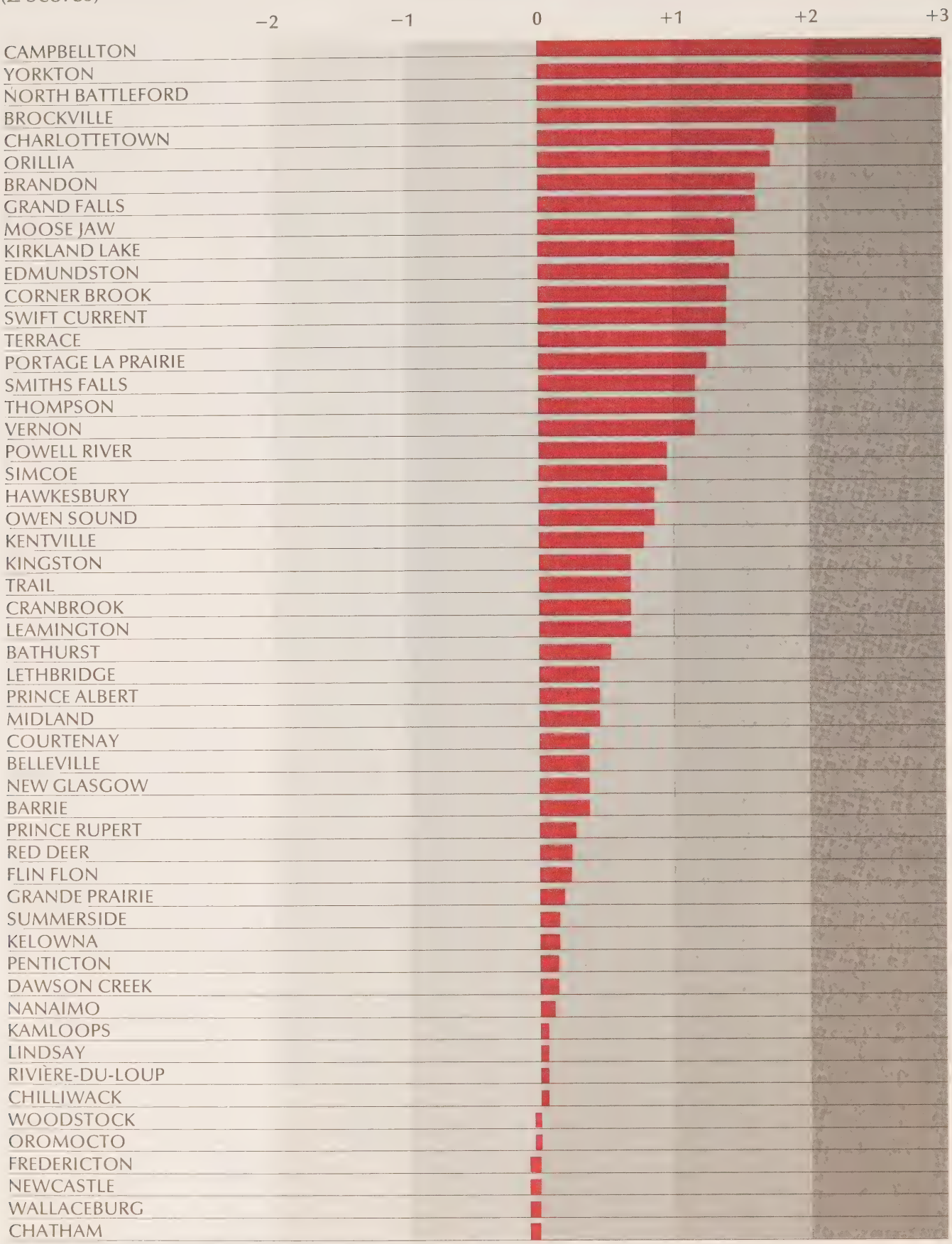
Other possible measures such as the number of patients seen per general practitioner per year or the ratio of all medical service providers to the population have difficulties of their own, in addition to not being available. In the first case, knowing the number of patients seen fails to tell us how many had long delays in receiving treatment or simply did not seek treatment because of the difficulty entailed in getting access. Use of the second measure increases the problem of variations in the quality of treatment received. For example, communities with a large number of nurses, but few doctors, would rate as well in accessibility as communities with the same number of service providers, a greater proportion of whom were physicians.

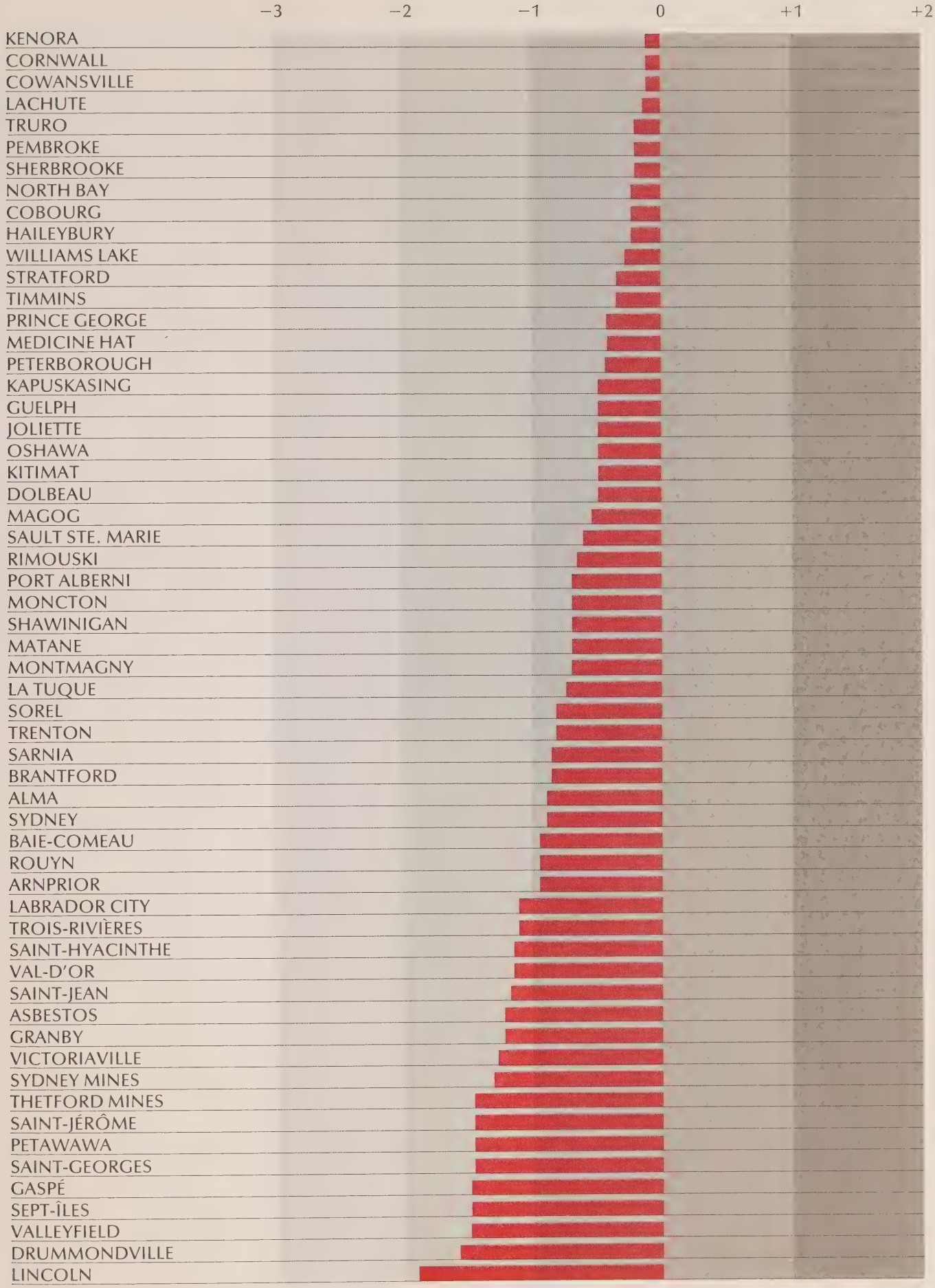
TABLE 23: PHYSICIANS: GENERAL PRACTITIONERS PER 1000 POPULATION (1975)

ATLANTIC REGION	Bathurst	1.40	Moncton*	.83
	Campbellton*	2.92	Newcastle*	1.11
	Charlottetown*	1.97	New Glasgow*	1.28
	Corner Brook	1.79	Oromocto	1.12
	Edmundston	1.58	Summerside*	1.21
	Fredericton*	1.12	Sydney*	.74
	Grand Falls*	1.90	Sydney Mines*	.55
	Kentville*	1.51	Truro*	1.05
	Labrador City*	.66		
QUÉBEC REGION	Alma	.74	Rivière-du-Loup	1.16
	Asbestos*	.60	Rouyn*	.68
	Baie-Comeau*	.69	Saint-Georges*	.49
	Cowansville	1.09	Saint-Hyacinthe*	.63
	Dolbeau*	.92	Saint-Jean*	.61
	Drummondville*	.42	Saint-Jérôme*	.50
	Gaspé	.47	Sept-Îles	.47
	Granby*	.59	Shawinigan*	.82
	Joliette*	.94	Sherbrooke*	1.04
	Lachute*	1.07	Sorel*	.78
	La Tuque	.80	Thetford Mines*	.51
	Magog*	.90	Trois-Rivières*	.63
	Matane	.81	Val-d'Or*	.62
	Montmagny	.81	Valleyfield*	.45
	Rimouski*	.88	Victoriaville*	.56
ONTARIO REGION	Arnprior*	.67	Midland*	1.35
	Barrie*	1.27	North Bay	1.03
	Belleville	1.28	Orillia	1.94
	Brantford*	.76	Oshawa*	.93
	Brockville	2.17	Owen Sound	1.52
	Chatham	1.10	Pembroke*	1.04
	Cobourg*	1.03	Petawawa*	.49
	Cornwall	1.10	Peterborough*	.98
	Guelph*	.94	Sarnia*	.76
	Haileybury*	1.02	Sault Ste. Marie*	.89
	Hawkesbury*	1.55	Simcoe	1.58
	Kapuskasing	.94	Smiths Falls*	1.69
	Kenora*	1.10	Stratford	.99
	Kingston*	1.49	Timmins*	.99
	Kirkland Lake	1.83	Trenton*	.78
	Leamington	1.47	Wallaceburg	1.10
	Lincoln	.21	Woodstock	1.13
	Lindsay	1.16		
PRAIRIES REGION	Brandon	1.80	Portage la Prairie	1.73
	Flin Flon*	1.22	Prince Albert	1.37
	Grande Prairie	1.22	Red Deer	1.22
	Lethbridge	1.37	Swift Current	1.77
	Medicine Hat*	.98	Thompson	1.67
	Moose Jaw	1.84	Yorkton	2.60
	North Battleford*	2.23		
BRITISH COLUMBIA REGION	Chilliwack*	1.15	Port Alberni*	.84
	Courtenay*	1.30	Powell River	1.61
	Cranbrook	1.48	Prince George*	.98
	Dawson Creek	1.18	Prince Rupert*	1.22
	Kamloops*	1.16	Terrace*	1.77
	Kelowna*	1.21	Trail*	1.48
	Kitimat	.93	Vernon	1.44
	Nanaimo*	1.17	Williams Lake*	1.01
	Penticton	1.20		

NOTES: 1971 boundaries are used for all urban areas.
SOURCE: DREE Community Data Files, 1978.
Department of Regional and Economic Expansion.

GRAPH 21. PHYSICIANS: GENERAL PRACTITIONERS PER 1000 POPULATION (1975)
(Z Scores)

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KENORA
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COWANSVILLE
LACHUTE
TRURO
PEMBROKE
SHERBROOKE
NORTH BAY
COBOURG
HAILEYBURY
WILLIAMS LAKE
STRATFORD
TIMMINS
PRINCE GEORGE
MEDICINE HAT
PETERBOROUGH
KAPUSKASING
GUELPH
JOLIETTE
OSHAWA
KITIMAT
DOLBEAU
MAGOG
SAULT STE. MARIE
RIMOUSKI
PORT ALBERNI
MONCTON
SHAWINIGAN
MATANE
MONTMAGNY
LA TUQUE
SOREL
TRENTON
SARNIA
BRANTFORD
ALMA
SYDNEY
BAIE-COMEAU
ROUYN
ARNPRIOR
LABRADOR CITY
TROIS-RIVIÈRES
SAINT-HYACINTHE
VAL-D'OR
SAINT-JEAN
ASBESTOS
GRANBY
VICTORIAVILLE
SYDNEY MINES
THETFORD MINES
SAINT-JÉRÔME
PETAWAWA
SAINT-GEORGES
GASPÉ
SEPT-ÎLES
VALLEYFIELD
DRUMMONDVILLE
LINCOLN

INFANT MORTALITY: DEATHS PER 10 000 POPULATION — ANNUAL AVERAGE (1972-74)

ASPECT MEASURED	In order to indicate the level of health in the community, the annual average of infant deaths per 10 000 population from 1972 to 1974, inclusive, is utilized (infants are defined as children under one year of age). The rationale for choosing this measure is as follows: the probability of an infant dying is a function of the health of the mother, the physical conditions in which the child lives, genetic factors, the lifestyle of the parent, the quality of medical facilities and services, as well as several other related factors. Many of these factors also have an important affect on the health of non-infants. Thus, infant mortality may be taken as a general proxy for the level of health obtained in the community as a whole.	Deaths are reported by location of residence, not location of occurrence. The measure does not include stillbirths. For some census agglomerations, information was only available for the principal municipality. A three-year average was utilized to smooth out random fluctuations and thus increase the reliability of comparisons between urban areas.
DIFFICULTIES OF INTERPRETATION	There are at least three problems entailed in using infant mortality as an indicator of community health. First, the use of infant mortality fails to portray directly variations in the level of health in that it only indicates the consequences of extremely poor health. However, it does seem plausible to suggest that there should be a higher mortality rate in a community when the general level of health is lower. A second difficulty is that the health of infants may not be representative of the health of other segments of the population.	Health facilities and services for infants may be more, or less, developed than those for other age groups, resulting in the measure giving a false indication of the overall health of the community. Finally, variations in a centre's infant mortality rates may reflect differences in fertility rates rather than actual differences in community health. Communities with high fertility rates simply have more infants and thus are more likely to have a greater number of infant deaths per 10 000 population.

URBAN PATTERN

Average infant mortality rates within regions range from a high of 3.9 in British Columbia[6] through rates of 3.3 in the Prairies, 3.2 in the Atlantic Region, 2.7 in Québec, to a low of 2.5 in Ontario. Variation in city rates within regions is greatest in the Atlantic Region (S = 1.3) and least in Ontario (S = 0.8). Respective standard deviation scores for the Prairies, British Columbia and Québec are 1.2, 1.1 and 1.0. In sum, the use of this indicator suggested that Ontario centres generally enjoy the highest standard of health while centres in British Columbia tend to have relatively less desirable health conditions.

Nationally, city infant mortality rates are positively correlated with the distance to the nearest metropolitan centre, the youth dependency ratio and the rate of population change between 1971 and 1976. To a large extent, centres which are located far from a metropolis, have high youth dependency ratios and a high rate of population change can be accurately described as resource communities. Inspection of the data shows that resource centres in the remote hinterland tend to have the highest infant mortality rates (e.g., Rouyn, Sept-Îles, Val-d'Or, Thompson, Terrace and Williams Lake).

a) Overall aggregate values	Infant mortality per 10 000 population (1972-74)
Mean ($\bar{X}$)	3.0
Standard deviation (S)	1.5
Maximum	13.1
Minimum	0.6

b) By region	$\bar{X}$	S	N
Atlantic	3.2	1.3	16
Québec	2.7	1.0	30
Ontario	2.5	0.8	35
Prairies	3.3	1.2	12
British Columbia	3.0	1.1	16

[6]It should be noted that Williams Lake has been excluded in the calculation of the statistics for centres in British Columbia.

OTHER MEASURES

There are at least three types of measures which can be used to assess the health level of a city's population. First, there are measures of mortality such as the one used here. Other measures of this kind include "infant deaths per 1000 live births" (which takes account of variation in birth rates between cities), age-adjusted death rates for the population of a community as a whole, and mortality and morbidity rates for particular groups of diseases.

Indicators of a second type can be developed from data on the utilization of health care facilities and services. One example of this type of indicator is the number of patient days per year spent in hospital. Unfortunately, the validity of this measure and others based on utilization is open to question. Variation in the size of catchment areas, in the size of facilities and in admission practices are all factors which make cross-community comparison of health questionable.

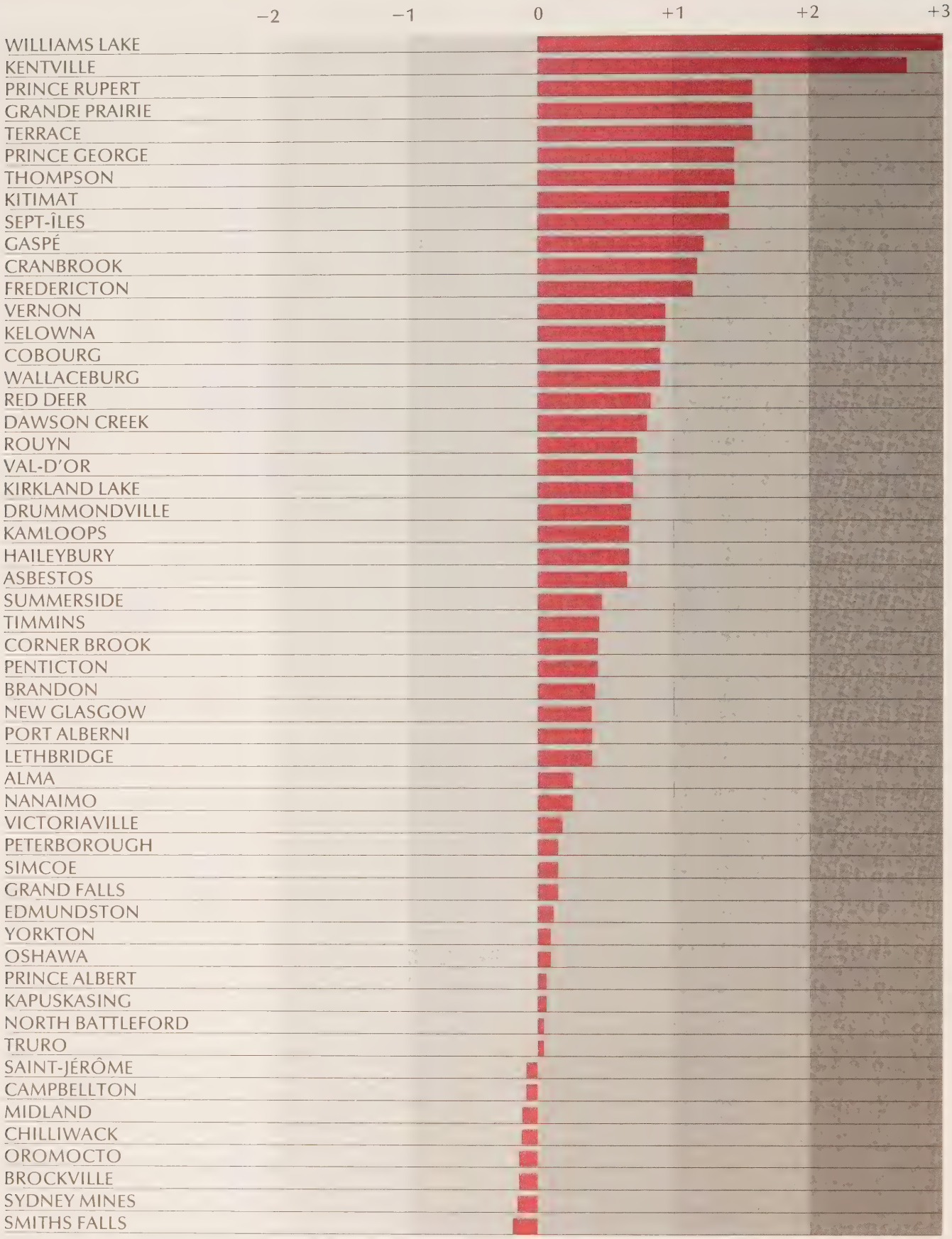
A third type of health indicator is based on information on the health and lifestyle habits of the population. The information sources for this type of measure are surveys that reveal the extent to which the population pursues activities that are beneficial to health (e.g., physical fitness programs, annual visit to physician) or potentially injurious (e.g., excessive smoking or consumption of alcohol). However, this type of information is usually only available from sample surveys which are statistically reliable only at the national or regional level (e.g., Statistics Canada's Canada Health Survey, 1978; and Statistics Canada's Survey of Fitness, Physical Recreational and Sport, 1976).

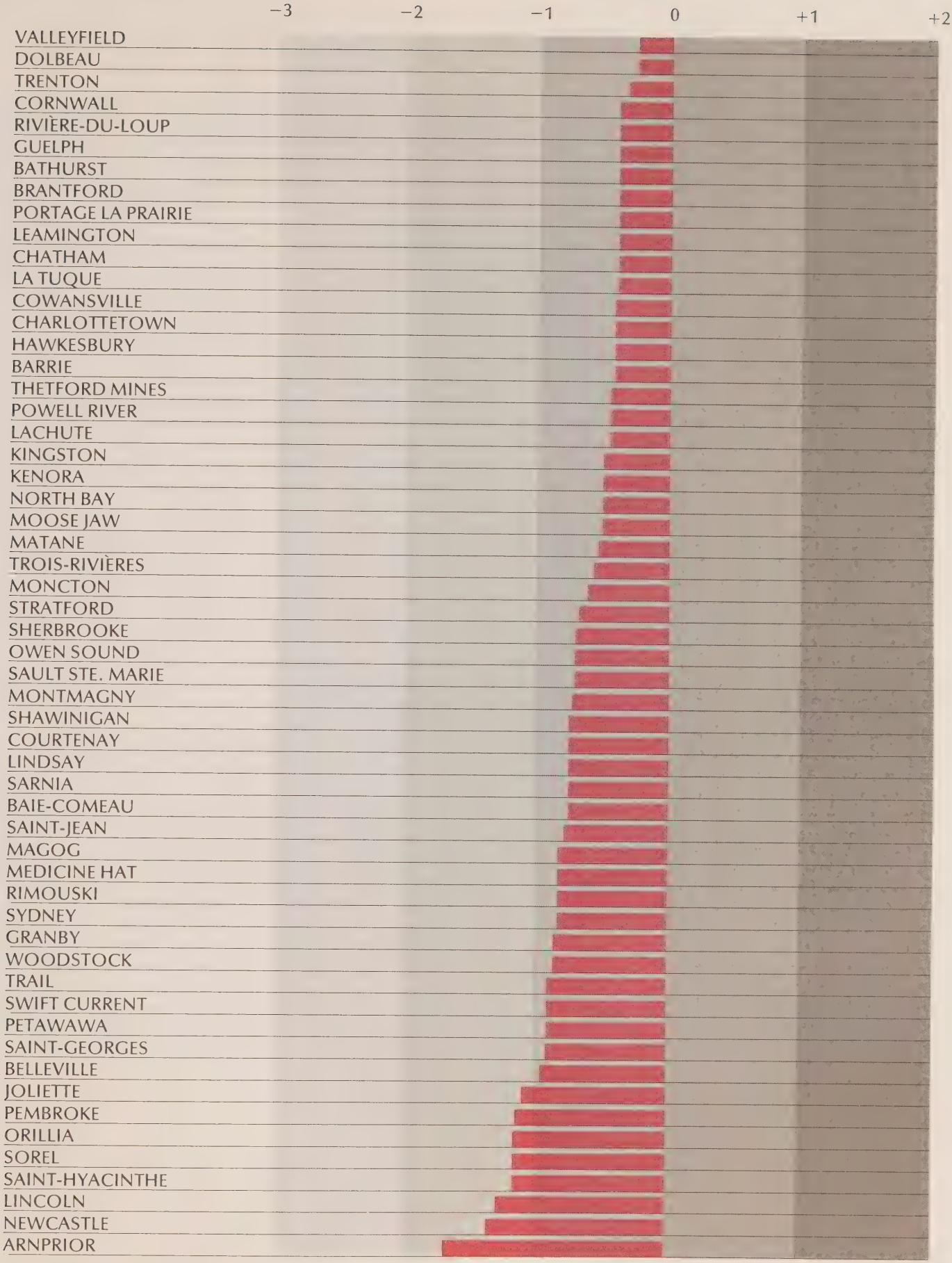
TABLE 24. INFANT MORTALITY: DEATHS PER 10 000 POPULATION (1972-74)

ATLANTIC REGION	Bathurst	2.60	Moncton*	2.20
	Campbellton*	2.95	Newcastle*	1.06
	Charlottetown*	2.51	New Glasgow*	3.55
	Corner Brook	3.67	Oromocto	2.92
	Edmundston	3.23	Summerside*	3.77
	Fredericton*	4.67	Sydney*	1.83
	Grand Falls*	3.24	Sydney Mines*	2.85
	Kentville*	7.05	Truro*	3.06
	Labrador City*	+		
QUÉBEC REGION	Alma	3.34	Rivière-du-Loup	2.61
	Asbestos*	3.83	Rouyn*	4.11
	Baie-Comeau*	1.98	Saint-Georges*	1.72
	Cowansville	2.52	Saint-Hyacinthe*	1.33
	Dolbeau*	2.74	Saint-Jean*	1.94
	Drummondville*	3.94	Saint-Jérôme*	3.02
	Gaspé	4.84	Sept-Îles	5.07
	Granby*	1.78	Shawinigan*	2.13
	Joliette*	1.48	Sherbrooke*	2.17
	Lachute*	2.40	Sorel*	1.35
	La Tuque	2.54	Thetford Mines*	2.42
	Magog*	1.85	Trois-Rivières*	2.21
	Matane	2.25	Val-d'Or*	4.02
	Montmagny	2.14	Valleyfield*	2.76
	Rimouski*	1.84	Victoriaville*	3.27
ONTARIO REGION	Arnprior*	0.55	Midland*	2.95
	Barrie*	2.50	North Bay	2.30
	Belleville	1.61	Orillia	1.39
	Brantford*	2.59	Oshawa*	3.18
	Brockville	2.87	Owen Sound	2.17
	Chatham	2.55	Pembroke*	1.41
	Cobourg*	4.43	Petawawa*	1.73
	Cornwall	2.62	Peterborough*	3.26
	Guelph*	2.61	Sarnia*	2.04
	Haileybury*	3.86	Sault Ste. Marie*	2.16
	Hawkesbury*	2.51	Simcoe	3.24
	Kapuskasing	3.12	Smiths Falls*	2.78
	Kenora*	2.30	Stratford	2.18
	Kingston*	2.31	Timmins*	3.74
	Kirkland Lake	3.95	Trenton*	2.63
	Leamington	2.55	Wallaceburg	4.42
	Lincoln	1.17	Woodstock	1.78
	Lindsay	2.09		
PRAIRIES REGION	Brandon	3.64	Portage la Prairie	2.57
	Flin Flon*	+	Prince Albert	3.16
	Grande Prairie	5.35	Red Deer	4.22
	Lethbridge	3.48	Swift Current	1.73
	Medicine Hat*	1.85	Thompson	5.09
	Moose Jaw	2.30	Yorkton	3.23
	North Battleford*	3.10		
BRITISH COLUMBIA REGION	Chilliwack*	2.94	Port Alberni*	3.49
	Courtenay*	2.10	Powell River	2.42
	Cranbrook	4.72	Prince George*	5.14
	Dawson Creek	4.21	Prince Rupert*	5.37
	Kamloops*	3.91	Terrace*	5.34
	Kelowna*	4.46	Trail*	1.75
	Kitimat	5.08	Vernon	4.52
	Nanaimo*	3.34	Williams Lake*	13.10
	Penticton	3.67		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Statistics Canada Health Division, *Vital Statistics, Volume III, Deaths,* Cat. 84-206, for the years 1972-74 (Ottawa: 1974-76).

GRAPH 22. INFANT MORTALITY: DEATHS PER 10,000 POPULATION (1972-74)
(Z Scores)




−3
−2
−1
0
+1
+2
VALLEYFIELD
DOLBEAU
TRENTON
CORNWALL
RIVIÈRE-DU-LOUP
GUELPH
BATHURST
BRANTFORD
PORTAGE LA PRAIRIE
LEAMINGTON
CHATHAM
LA TUQUE
COWANSVILLE
CHARLOTTETOWN
HAWKESBURY
BARRIE
THETFORD MINES
POWELL RIVER
LACHUTE
KINGSTON
KENORA
NORTH BAY
MOOSE JAW
MATANE
TROIS-RIVIÈRES
MONCTON
STRATFORD
SHERBROOKE
OWEN SOUND
SAULT STE. MARIE
MONTMAGNY
SHAWINIGAN
COURTENAY
LINDSAY
SARNIA
BAIE-COMEAU
SAINT-JEAN
MAGOG
MEDICINE HAT
RIMOUSKI
SYDNEY
GRANBY
WOODSTOCK
TRAIL
SWIFT CURRENT
PETAWAWA
SAINT-GEORGES
BELLEVILLE
JOLIETTE
PEMBROKE
ORILLIA
SOREL
SAINT-HYACINTHE
LINCOLN
NEWCASTLE
ARNPRIOR

"Leisure is not something added to life, a busy-idle diversion or a long, drawn out sigh of relief after work . . . it is the process that builds meaning and purpose into life."[7]

The past two decades have witnessed a shift in interest among many Canadians from purely economic responsibilities to quality-of-life concerns, including job satisfaction, environmental quality and leisure activities. In the broadest sense, leisure may be described as a state of mind in which the individual participates in activities for the sake of the activity, with an awareness that the activity has the potential to create a sense of personal well-being. Leisure, therefore, may be found in many aspects of life (e.g., formal study, social functions and active recreational pursuits). It is not necessarily defined by time or the type of activity, but is characterized by the attainment of personal self-fulfillment, an improvement in the quality of one's life.

Although the definition of leisure-oriented activities is highly subjective, leisure pursuits are often defined, for operational purposes, as those activities which take place during the time *not* used in: (1) remunerative employment; (2) activities related to remunerative employment such as commuting; and (3) other obligatory activities such as household chores and personal maintenance. In this narrower context, there has been some increase in leisure time for certain segments of the population, due to trends towards shorter working hours, more holidays and labour-saving devices which have shortened the time devoted to household maintenance.

The activities pursued by Canadians during their leisure time are limited only by individual imagination and resources, varying from social events (including attendance at the theatre or disco-hopping) to outdoor recreation (such as hiking or canoeing) to home-based activities (like refinishing antiques or reading a mystery thriller). For the majority of the population, however, certain leisure activities hold a far more prominent place in their lifestyle than others. Despite the surge in participation in outdoor recreation, the majority of the time allotted to leisure by most Canadians is spent in the home watching television, listening to radio and reading newspapers, magazines and books. Outside the home, recreation of both a relaxed nature (such as camping, golfing and sunbathing) and a more vigorous nature (such as sailing, skiing and horseback riding) have become a major source of enjoyment for many Canadians. Generally less frequent, but quite important to some people, are visits to the theatre, art galleries and museums. Although time spent in attending cultural events and facilities is proportionately small, the appreciation that individuals acquire of artistic endeavours and of their cultural heritage makes these activities an important aspect of a community's quality of life.

The demand for cultural and recreational facilities in a city and the level of participation in various leisure-time pursuits are governed by many factors. Among other things, people's ability to participate in an activity depends on their amount of time free from obligatory duties and the financial resources which are available to purchase the necessary equipment, memberships or admissions. Also, appreciation of the fine arts and, hence, patronage of cultural events tend to be related to people's level of education. A person's age, level of fitness and degree of athletic prowess affects the type and extent of participation in sports and outdoor recreation.

[7]Charles Obermyer, "Challenges and Contradictions" in M. Kaplan and P. Bosserman (eds.), *Technology, Leisure and Human Values* (New York: Obingdon Press, 1971), pp. 221-222.

The supply of facilities, services and programs of sufficient diversity and scale clearly have an effect on the type and degree of people's participation in leisure-time pursuits and, therefore, upon their quality of life. Also important, however, is the quality of the facilities including, where appropriate, the location and frequency of events, the hours of operation, the degree of supervision, as well as the extent and variety of programming. Also, the enjoyment of leisure-time pursuits may be further enhanced if the design of facilities and the programming are attuned to the needs of diverse segments of the population including children, young people, housewives, the elderly and minority ethnic groups.

Comparative information on the supply and use of cultural and recreational facilities is relatively limited at the scale of the urban centre on a nation-wide basis. Data concerning the attributes, location and attendance at facilities are not available in a reliable, consistent form and, thus, cannot be presented. Nevertheless, measures were selected to reflect, in so far as possible, the broad array of leisure pursuits in which different segments of a community's residents may be engaged. Overall indices for socio-cultural pursuits and recreational activities are provided. The choices available for sedentary, home-based leisure are monitored by the measures "cable television channels available" and "weekly newspaper circulation". The volume of books loaned from public library facilities provide an indication of the degree to which leisure-time reading is enjoyed by the residents of urban areas. Finally, cultural and artistic events are measured by the spectrum of museums, exhibition halls and art galleries in a city.

TECHNICAL NOTES

With the exception of the indicators concerning television reception and newspaper circulation, all measures of socio-cultural and recreational facilities were derived from Phases II and III of the National Study of the Supply of Sports and Recreation Facilities conducted by the Fitness and Amateur Sport Branch of the Federal Department of Health and Welfare. Socio-cultural facilities were inventoried in 1935 Canadian municipalities.[8] This comprised 66 per cent of all Canadian localities with 1000 people or more, plus other smaller places in Nova Scotia and Newfoundland. Field work was conducted during the summer of 1972. The facilities inventoried in the study were those open to the general public during the preceding year and situated within the official limits of the municipalities surveyed.

The inventory of 18 different types of sports facilities was conducted in 1518 Canadian municipalities.[9] This included 67.5 per cent of all Canadian localities with 1000 people or more and 84.5 per cent of Canadian cities, towns or villages with 1000 people or more. The facilities inventoried in the study were those completely constructed as of September 1974 and situated within the official limits of the municipality surveyed. The definitions used in the study for specific facilities were derived from the manuals and specialists of national and provincial sport organizations. In every instance, the definitions of facilities imply that "official" games can be played on the premises; facilities that presented obvious danger or inadequacies for games were excluded.

[8]Health and Welfare Canada, *National Study on the Supply of Sports and Recreation Facilities, Phase II, Inventory of Socio-Cultural Facilities, Final Technical Report* (Ottawa: Fitness and Amateur Sport Branch, Health and Welfare Canada, December 1974), p. 10.

[9]Health and Welfare Canada, *National Study on the Supply of Sports and Recreation Facilities, Phase III, Inventory of Sports Facilities, Final Technical Report* (Ottawa: Fitness and Amateur Sport Branch, Health and Welfare Canada, December 1975).

Several cautionary notes are in order concerning the degree of reliability and validity of the information collected in these surveys. Despite the utmost care taken in training interviewers, coordinating field operations, recording the information onto questionnaires and subsequently coding and verifying the data, inaccuracies do exist in the survey results. There are three major sources of error: estimations made by respondents, coverage problems and definitional difficulties. Although the data collection strategy minimized the recording of false information, specific variables such as "floor area of facility" required that the respondent provide estimates (i.e., of room dimensions) and are, therefore, less accurate. For the surveys as a whole, it has been estimated that the level of non-coverage ranged from 15 to 20 per cent.[10] Also, an urban centre may have more facilities of a specific type than were inventoried because the omitted facilities did not fit the operational definition employed in the study.[11]

As a consequence, an analysis of broad regional differences should be emphasized rather than a detailed comparison of facility provision between pairs of individual communities. The reader is cautioned against using the facilities inventory to identify conclusively communities that are deficient in facilities. In order to determine properly whether an urban centre was comparatively deprived of leisure facilities, additional types of information would be required, including participation data, desires/aspirations data and a qualitative assessment of the natural and man-made facilities available in each community.[12]

SOCIO-CULTURAL FACILITIES (1972): GUTTMAN SCALE INDEX OF FACILITY PROVISION

ASPECT MEASURED

The scale provides an overall indication of the array of different types of socio-cultural facilities available in a community. The measure reflects the level of opportunity offered to residents to obtain an appreciation of the arts and an understanding of their cultural heritage. The scale denotes the range of choice open to residents for visiting or attending cultural events or displays. Also inherent in the index is a sense of the degree to which cultural pursuits have developed and specialized in a community, from the multi-purpose auditorium which can accommodate a variety of modest amateur productions to facilities designed specifically for theatre and music, replete with the sophisticated sound, lighting and stage equipment necessary to meet the requirements of high quality professional presentations.

More specifically, a ten-item scale was developed, as is shown below. The scale ranges from the most ubiquitously available facility (e.g., multi-purpose auditorium = 1) to more highly specialized facilities often found only in the larger centres (e.g., auditorium with music = 10). The scale is incremental in nature. A community which has a theatre (scale score = 6) is typically expected to have all lower order facilities such as a library (scale score = 2), but no higher order facilities, such as an exhibition hall (scale score = 9). The scale was developed by the Department of Regional Economic Expansion (DREE) on the basis of the national inventory of socio-cultural facilities.

[10]Phase II, *Inventory of Socio-Cultural Facilities*, 1974, p. 45-48; Phase III, *Inventory of Sports Facilities*, 1975, p. 51.

[11]Phase II, *Inventory of Socio-Cultural Facilities*, 1974, p. 43; Phase III, *Inventory of Sports Facilities*, 1975, p. 53.

[12]Phase III, *Inventory of Sports Facilities*, 1975, p. 8.

Facility type	Scale score
Multi-purpose Auditorium	1
Library	2
Auditorium Arena	3
Studio	4
Museum	5
Theatre	6
Art Gallery	7
Exhibition Hall	8
Auditorium with Theatre	9
Auditorium with Music	10

DIFFICULTIES OF INTERPRETATION

As an overall measure, the socio-cultural facilities scale provides a general reflection of the diversity of facilities available in a centre. The scale combines the many aspects of a community's culture, but does not necessarily indicate the existence of specific types of establishments oriented to the needs and interests of a particular segment of a city's population. Statistics that measure the reliability of a Guttman Scale, such as the coefficient of scalability and the coefficient of reliability, suggest that the socio-cultural scale is modestly robust.

URBAN PATTERN

A wider range of socio-cultural facilities is enjoyed by the residents of centres situated in Ontario, the Prairies and British Columbia than by their counterparts located in Québec and the Maritimes. Some cities in the Québec and Atlantic regions are particularly devoid of facilities.

Although exceptions exist, larger cities which have a sizeable and diverse market for cultural activities generally sport a broader than average array of socio-cultural facilities (e.g., Oshawa, Kingston, Sarnia, Sherbrooke, Trois-Rivières, Moncton and Prince George). Cities situated in close proximity to large, metropolitan centres are often deficient in the facilities provided, presumably since residents utilize the more attractive and specialized cultural amenities of the metropolis. (Examples include Saint-Hyacinthe, Saint-Jean, Saint-Georges and Valleyfield near Montréal.) Conversely, a tendency exists for towns located in recreational areas near densely populated areas (e.g., Orillia, Midland and North Bay in Toronto's urban field) to be blessed with a broad array of facilities (e.g., summer theatre) which presumably are oriented to serving a vacationing population drawn from wider areas.

Some evidence suggests that broad differences in educational levels and occupational structure between communities affect the level of supply and demand for cultural facilities. Many cities oriented to primary production, which consequently have a larger "blue collar" labour force, have a relatively low level of cultural amenities (e.g., Sydney Mines, Labrador City, Alma, Asbestos and Trail). By contrast, university and government administration centres, which have a more educated, "white collar" work force, often possess a wider than average spectrum of cultural activities (e.g., Charlottetown, Fredericton and Kingston). Perhaps due to the transient nature of the population, defence bases are notably lacking in cultural facilities (e.g., Oromocto and Petawawa).

Despite the tendencies identified, there are more exceptions than generalizable trends. It is well to remember that individual entrepreneurship, the perception and realization of an opportunity, as well as municipal budgetary allocations, can significantly shape the provision of cultural facilities. Clearly, the organization of the Shakespearian Festival at Stratford is symbolic of a unique initiative that can provide an air of distinctiveness to a city.

a) Overall aggregate values	Scale score		
Mean ($\bar{X}$)	6.0		
Standard deviation (S)	2.1		
Maximum	10.0		
Minimum	1.0		
b) By region	$\bar{X}$	S	N
Atlantic	4.8	1.9	17
Québec	5.3	2.5	30
Ontario	6.5	2.1	35
Prairies	7.1	1.3	13
British Columbia	6.6	1.1	17

OTHER MEASURES

Alternatives to an overall index of facility provision are of two kinds: summary measures of other aspects of leisure-time pursuits and indicators of the level of provision for specific facilities. Of considerable utility to planning the extent and nature of leisure facilities are time allocation studies which document the proportion of time that residents regularly devote to various types of activities.[13] Such information indicates the proportion of time available to citizens for leisure and the number of hours spent on a given activity. Measures that summarize the level of citizen involvement in social-cultural pursuits such as the level of attendance at presentations or the volume of admissions to facilities reflect the vibrance of cultural life in a community and point to the need for the expansion or contraction of programs. Indicators of a more specific nature refer to the features of a particular facility type such as the seating capacity of theatres, the floor area of meeting establishments, the display area of art galleries and the number of musical events held.

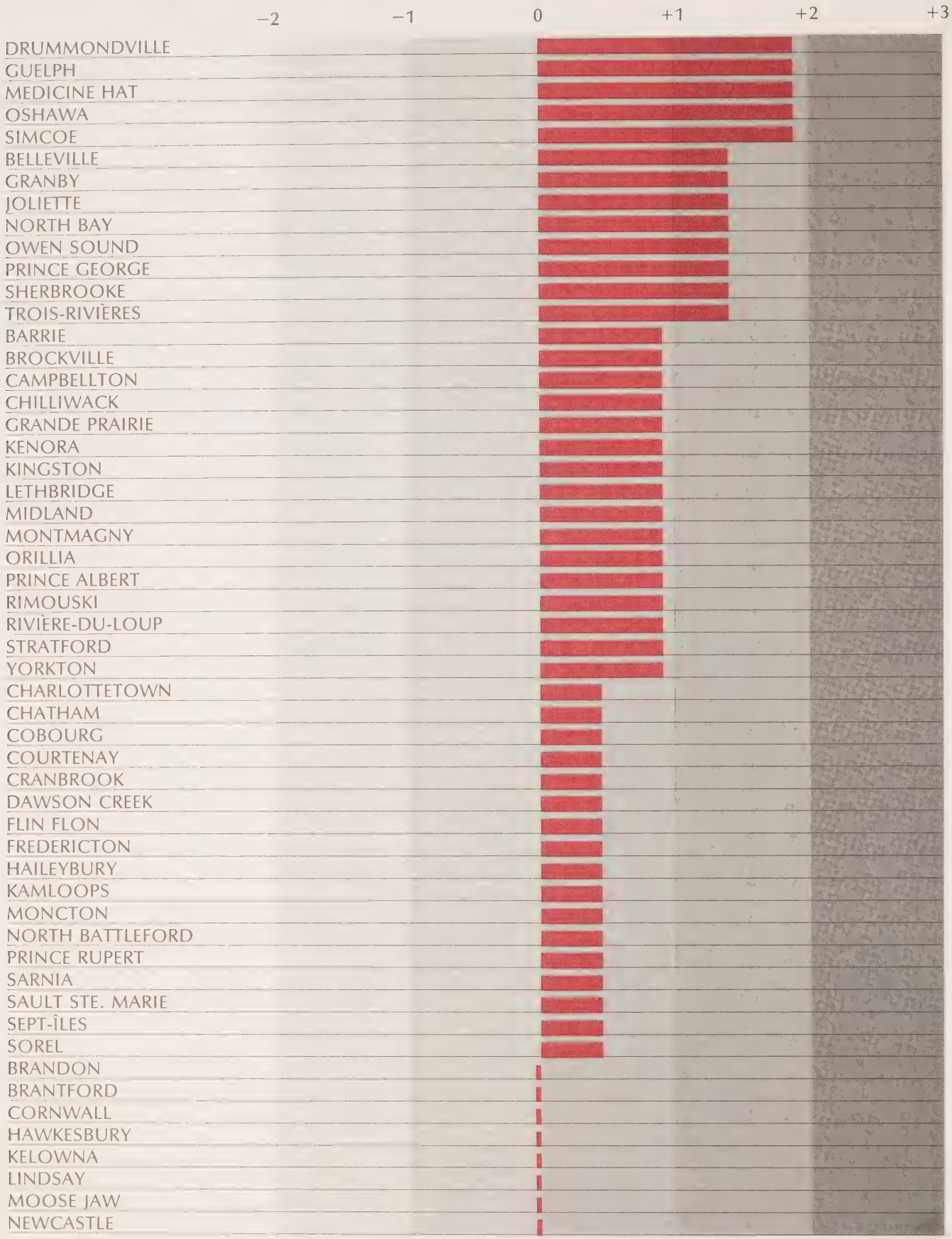
[13]Statistics Canada, Education, Science and Culture Division, *Survey of Physical Fitness, Recreation and Sport* (Ottawa: 1976).

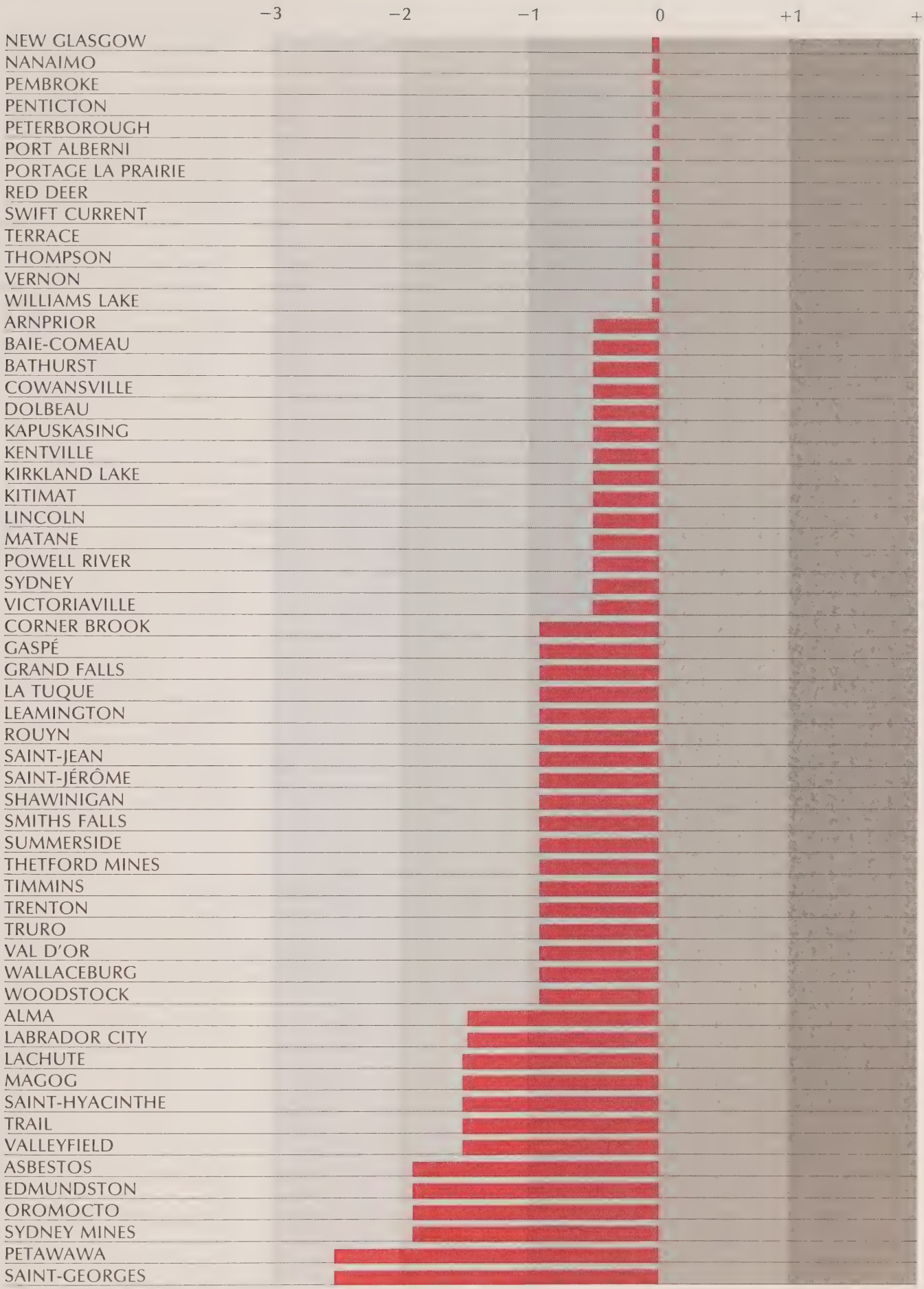
TABLE 25. SOCIO-CULTURAL FACILITIES: GUTTMAN SCALE INDEX OF FACILITY PROVISION (1972)

ATLANTIC REGION	Bathurst	5	Moncton*	7
	Campbellton*	8	Newcastle*	6
	Charlottetown*	7	New Glasgow*	6
	Corner Brook	4	Oromocto	2
	Edmundston	2	Summerside*	4
	Fredericton*	7	Sydney*	5
	Grand Falls*	4	Sydney Mines*	2
	Kentville*	5	Truro*	4
	Labrador City*	3		
QUÉBEC REGION	Alma	3	Rivière-du-Loup	8
	Asbestos*	2	Rouyn*	4
	Baie-Comeau*	5	Saint-Georges*	1
	Cowansville	5	Saint-Hyacinthe*	3
	Dolbeau*	5	Saint-Jean*	4
	Drummondville*	10	Saint-Jérôme*	4
	Gaspé	4	Sept-Îles	7
	Granby*	9	Shawinigan*	4
	Joliette*	9	Sherbrooke*	9
	Lachute*	3	Sorel*	7
	La Tuque	4	Thetford Mines*	4
	Magog*	3	Trois-Rivières*	9
	Matane	5	Val-d'Or*	4
	Montmagny	8	Valleyfield*	3
	Rimouski*	8	Victoriaville*	5
ONTARIO REGION	Arnprior*	5	Midland*	8
	Barrie*	8	North Bay	9
	Belleville	9	Orillia	8
	Brantford*	6	Oshawa*	10
	Brockville	8	Owen Sound	9
	Chatham	7	Pembroke*	6
	Cobourg*	7	Petawawa*	1
	Cornwall	6	Peterborough*	6
	Guelph*	10	Sarnia*	7
	Haileybury*	7	Sault Ste. Marie*	7
	Hawkesbury*	6	Simcoe	10
	Kapuskasing	5	Smiths Falls*	4
	Kenora*	8	Stratford	8
	Kingston*	8	Timmins*	4
	Kirkland Lake	5	Trenton*	4
	Leamington	4	Wallaceburg	4
	Lincoln	5	Woodstock	4
	Lindsay	6		
PRAIRIES REGION	Brandon	6	Portage la Prairie	6
	Flin Flon*	7	Prince Albert	8
	Grande Prairie	8	Red Deer	6
	Lethbridge	8	Swift Current	6
	Medicine Hat*	10	Thompson	6
	Moose Jaw	6	Yorkton	8
	North Battleford*	7		
BRITISH COLUMBIA REGION	Chilliwack*	8	Port Alberni*	6
	Courtenay*	7	Powell River	5
	Cranbrook	7	Prince George*	9
	Dawson Creek	7	Prince Rupert*	7
	Kamloops*	7	Terrace*	6
	Kelowna*	6	Trail*	3
	Kitimat	5	Vernon	6
	Nanaimo*	6	Williams Lake*	6
	Penticton	6		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Department of Regional Economic Expansion, Economic Development Analysis Division, *DREE Community Data Files*, (Ottawa: 1978). Derived from: Health and Welfare Canada, Fitness and Amateur Sports Branch, *National Study on the Supply of Sports and Recreation Facilities*, Phase II (Ottawa: 1974).

GRAPH 23. SOCIO-CULTURAL FACILITIES: GUTTMAN SCALE INDEX OF FACILITY PROVISION (1972) (Z Scores)




−3
−2
−1
0
+1
+2
NEW GLASGOW
NANAIMO
PEMBROKE
PENTICTON
PETERBOROUGH
PORT ALBERNI
PORTAGE LA PRAIRIE
RED DEER
SWIFT CURRENT
TERRACE
THOMPSON
VERNON
WILLIAMS LAKE
ARNPRIOR
BAIE-COMEAU
BATHURST
COWANSVILLE
DOLBEAU
KAPUSKASING
KENTVILLE
KIRKLAND LAKE
KITIMAT
LINCOLN
MATANE
POWELL RIVER
SYDNEY
VICTORIAVILLE
CORNER BROOK
GASPÉ
GRAND FALLS
LA TUQUE
LEAMINGTON
ROUYN
SAINT-JEAN
SAINT-JÉRÔME
SHAWINIGAN
SMITHS FALLS
SUMMERSIDE
THETFORD MINES
TIMMINS
TRENTON
TRURO
VAL D'OR
WALLACEBURG
WOODSTOCK
ALMA
LABRADOR CITY
LACHUTE
MAGOG
SAINT-HYACINTHE
TRAIL
VALLEYFIELD
ASBESTOS
EDMUNDSTON
OROMOCTO
SYDNEY MINES
PETAWAWA
SAINT-GEORGES

ASPECT MEASURED

The scale reflects the range of different types of recreational facilities provided in a community. It provides an indication of the relative diversity of interests that can be served by a community's facility base. A centre with a full complement of facilities included in the scale would possess facilities that cater to the needs and interests of those of differing ages, financial resources and orientations to recreational activities that require varying degrees of fitness, endurance, skill or precision.

The recreational facilities scale provides a sense of the range of choice available to residents of different ages, degrees of fitness and financial capability for pursuing recreational activities of varying levels of physical rigour, skill and intensity. For example, playgrounds are typically used almost exclusively by young children, while baseball fields are primarily oriented to youthful competitors and lawn bowling greens are generally the preserve of the elderly. In addition, some facilities and sporting activities typically require minimal direct financial commitment on the part of participants (e.g., sports fields, bowling) while others invariably require a substantial outlay of monies by enthusiasts for memberships and equipment (e.g., equestrian facilities, executive par-3 golf). Also, a broad spectrum of facilities provides for activities that can help develop fitness (e.g., squash courts and swimming pools), endurance (e.g., cinder tracks), skill and precision (e.g., shooting range) or team cooperation (e.g., sports fields). Thus, the broader the range of choice in facilities and activities available in a community, it is suggested, the more likely that people will find a recreational activity suited to their resources, age and fitness level, and hence, the higher their quality of life.

More specifically, an eighteen-item scale was devised as presented below. The scale progresses incrementally from the most common and widely available facility (e.g., playground = 1) to more specialized facilities with a smaller user population (e.g., handball court = 16; lawn bowling green = 17). Communities possessing a certain level of facility (e.g., indoor swimming pool = 10) should typically have all lower order facilities (i.e., from playgrounds to golf courses). The scale scores, it should be noted, provide no indication of the number of facilities of a particular kind available, but rather, measure the range of different facility types provided. The scale was developed by the Department of Regional Economic Expansion (DREE) on the basis of the national inventory of sports facilities.

Facility type	Scale score
Playground	1
Softball Field	2
Gymnasium	3
Sports Field	4
Baseball Diamond	5
Tennis Court	6
Bowling Alley	7
Artificial Ice Rink	8
Golf Course	9
Indoor Swimming Pool	10
Curling Rink	11
Shooting Range	12
Outdoor Ice Rink	13
Cinder Track	14
Equestrian Facilities	15
Handball/Squash Court	16
Lawn Bowling Green	17
Golf Par-3, Executive	18

DIFFICULTIES OF INTERPRETATION

As a summary measure of the range of facility types available in a community, the recreational facilities scale serves well. The scale combines the diverse facets of a community's recreational resources, but does not indicate the presence of specific types of facilities (e.g., ball diamonds) oriented to the interests of a particular segment of a city's population (e.g., baseball players). From a technical standpoint, the statistics that measure the reliability of a Guttman Scale, such as the coefficient of scalability and the coefficient of reliability, suggest that the recreation scale is modestly robust.

URBAN PATTERN

Regional variation in the range of recreational facilities available is relatively low. A somewhat broader array of facilities is found in Ontario and Prairie cities, while the range of recreational opportunities is less diverse in Québec communities.

The array of facilities available in the larger cities of 50 000 to 100 000 is above average in virtually all cases. Citizens residing in the more populous centres like Sydney, Shawinigan and Sherbrooke, as well as Brantford, Sault Ste. Marie and Prince George were afforded a broader range of choice in sports facilities than the residents of smaller communities. By contrast, there is some tendency in all regions of the country for small isolated places, notably northern mining communities, pulp and paper towns and service centres in economically disadvantaged areas, to offer only the most basic recreational amenities. For example, scoring five or less on the Guttman Scale index of facility provision were Grand Falls and Corner Brook, Gaspé and Rivière-du-Loup, Kirkland Lake and Hawkesbury, Thompson and Flin Flon, Dawson Creek and Williams Lake. However, as the minimum score suggests, at least some facilities were provided in each urban area.

a) Overall aggregate values	Scale score
Mean ($\bar{X}$)	8.4
Standard deviation (S)	3.6
Maximum	16.0
Minimum	3.0

b) By region	$\bar{X}$	S	N
Atlantic	8.4	4.0	17
Québec	7.9	3.0	30
Ontario	9.1	3.6	35
Prairies	8.8	4.1	13
British Columbia	7.9	3.9	17

OTHER MEASURES

Alternatives to the Guttman Scale index of facility provision range from measures of participation levels in leisure pursuits through to indicators of the quality and level of provision for particular facilities. More specifically, participation measures encompass the proportion of time that residents devote to recreational activities, the level of expenditures on sports equipment, memberships in recreational clubs and attendance at instructional programs and clinics.[14] Among other aspects, facility provision measures cover, where applicable, the number, the size, design, supervision and operating hours of sports facilities.

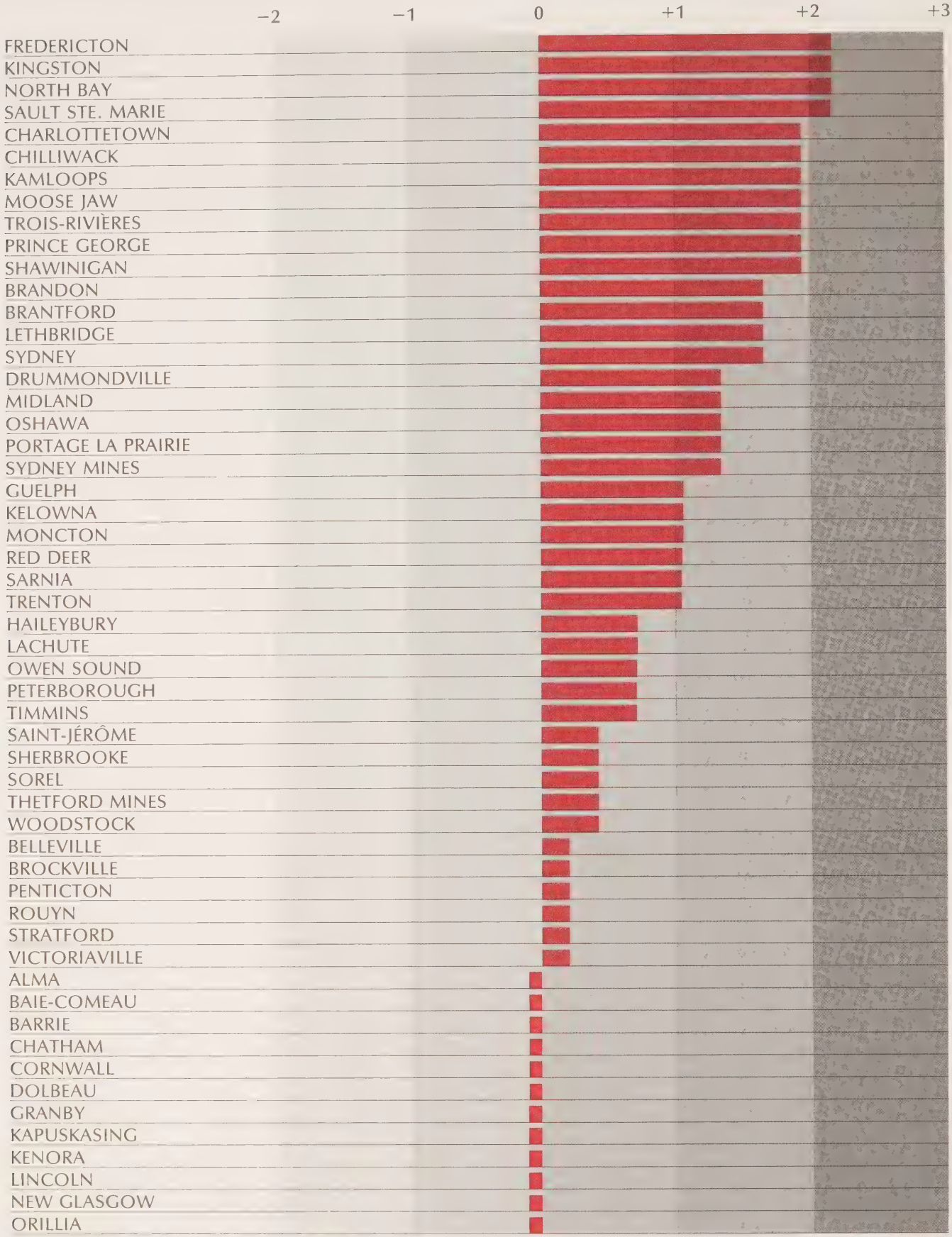
[14]Possible sources include: Statistics Canada, *Survey of Fitness, Physical Recreation and Sport*, 1976; Statistics Canada, Education, Science and Culture Division, *Recreational Activities*, Cat. 87-501 (Ottawa: 1978).

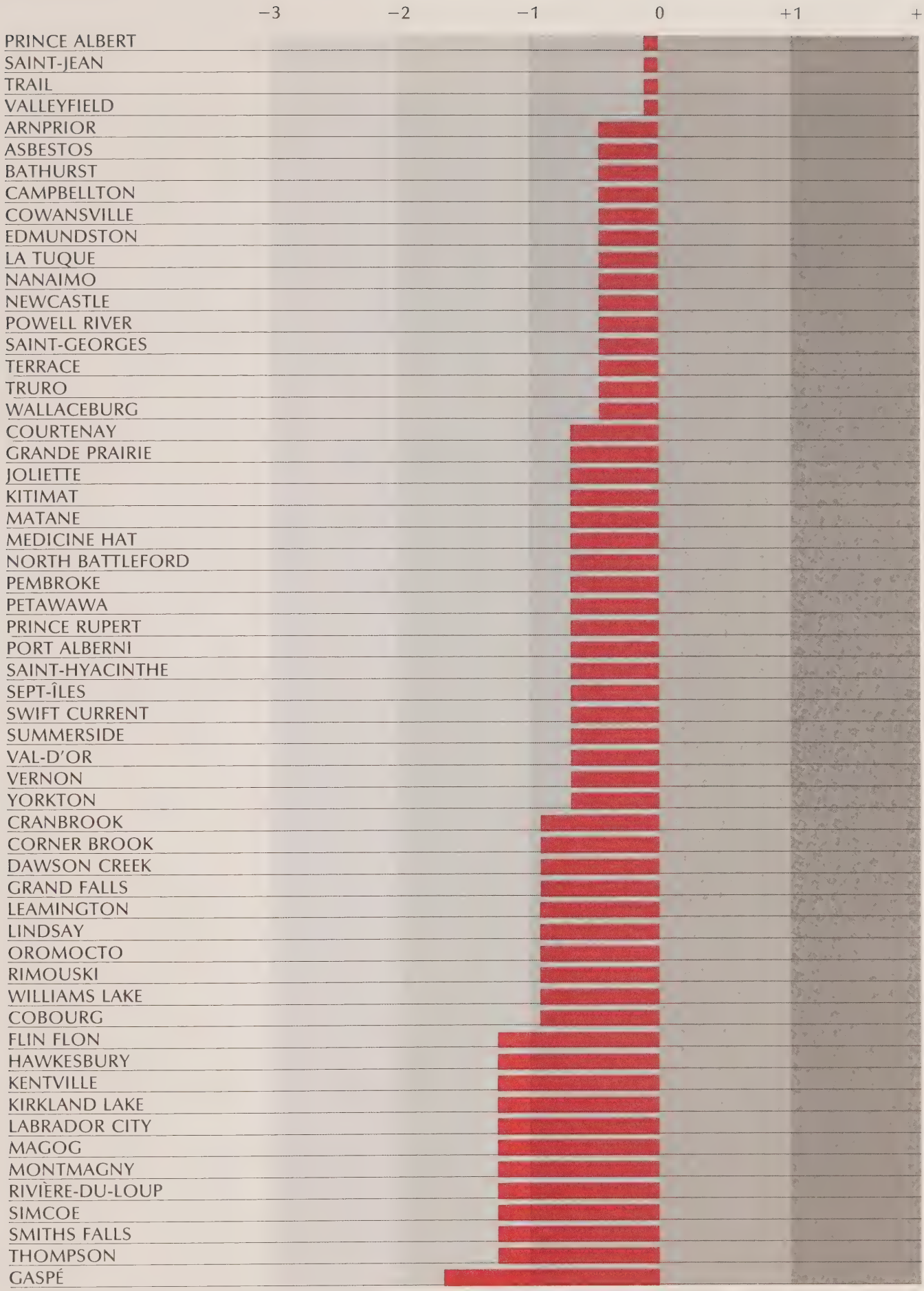
TABLE 26. RECREATIONAL AND LEISURE FACILITIES: GUTTMAN SCALE INDEX OF FACILITY PROVISION (1974)

ATLANTIC REGION	Bathurst	7	Moncton*	12
	Campbellton*	7	Newcastle*	7
	Charlottetown*	15	New Glasgow*	8
	Corner Brook	5	Oromocto	5
	Edmundston	7	Summerside*	6
	Fredericton*	16	Sydney*	14
	Grand Falls*	5	Sydney Mines*	13
	Kentville*	4	Truro*	7
	Labrador City*	4		
QUÉBEC REGION	Alma	8	Rivière-du-Loup	4
	Asbestos*	7	Rouyn*	9
	Baie-Comeau*	8	Saint-Georges*	7
	Cowansville	7	Saint-Hyacinthe*	6
	Dolbeau*	8	Saint-Jean*	8
	Drummondville*	13	Saint-Jérôme*	10
	Gaspé	3	Sept-Îles	6
	Granby*	8	Shawinigan*	15
	Joliette*	6	Sherbrooke*	10
	Lachute*	11	Sorel*	10
	La Tuque	7	Thetford Mines*	10
	Magog*	4	Trois-Rivières*	15
	Matane	6	Val-d'Or*	6
	Montmagny	4	Valleyfield*	8
	Rimouski*	5	Victoriaville*	9
ONTARIO REGION	Arnprior*	7	Midland*	13
	Barrie*	8	North Bay	16
	Belleville	9	Orillia	8
	Brantford*	14	Oshawa*	13
	Brockville	9	Owen Sound	11
	Chatham	8	Pembroke*	6
	Cobourg*	4	Petawawa*	6
	Cornwall	8	Peterborough*	11
	Guelph*	12	Sarnia*	12
	Haileybury*	11	Sault Ste. Marie*	16
	Hawkesbury*	4	Simcoe	4
	Kapuskasing	8	Smiths Falls*	4
	Kenora*	8	Stratford	9
	Kingston*	16	Timmins*	11
	Kirkland Lake	4	Trenton*	12
	Leamington	5	Wallaceburg	7
	Lincoln	8	Woodstock	10
	Lindsay	5		
PRAIRIES REGION	Brandon	14	Portage la Prairie	13
	Flin Flon*	4	Prince Albert	8
	Grande Prairie	6	Red Deer	12
	Lethbridge	14	Swift Current	6
	Medicine Hat*	6	Thompson	4
	Moose Jaw	15	Yorkton	6
	North Battleford*	6		
BRITISH COLUMBIA REGION	Chilliwack*	15	Port Alberni*	6
	Courtenay*	6	Powell River	7
	Cranbrook	5	Prince George*	15
	Dawson Creek	5	Prince Rupert*	6
	Kamloops*	15	Terrace*	7
	Kelowna*	12	Trail*	8
	Kitimat	6	Vernon	6
	Nanaimo*	7	Williams Lake*	5
	Penticton	9		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Department of Regional Economic Expansion, Economic Development Analysis Division, *DREE Community Data Files*, (Ottawa: 1978). Derived from: Health and Welfare Canada, Fitness and Amateur Sports Branch, *National Study on the Supply of Sports and Recreation Facilities*, Phase III (Ottawa: 1975).

GRAPH 24. RECREATIONAL AND LEISURE FACILITIES: GUTTMAN SCALE INDEX OF FACILITY PROVISION (1974) (Z Scores)

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VALLEYFIELD
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BATHURST
CAMPBELLTON
COWANSVILLE
EDMUNDSTON
LA TUQUE
NANAIMO
NEWCASTLE
POWELL RIVER
SAINT-GEORGES
TERRACE
TRURO
WALLACEBURG
COURTENAY
GRANDE PRAIRIE
JOLIETTE
KITIMAT
MATANE
MEDICINE HAT
NORTH BATTLEFORD
PEMBROKE
PETAWAWA
PRINCE RUPERT
PORT ALBERNI
SAINT-HYACINTHE
SEPT-ÎLES
SWIFT CURRENT
SUMMERSIDE
VAL-D'OR
VERNON
YORKTON
CRANBROOK
CORNER BROOK
DAWSON CREEK
GRAND FALLS
LEAMINGTON
LINDSAY
OROMOCTO
RIMOUSKI
WILLIAMS LAKE
COBOURG
FLIN FLON
HAWKESBURY
KENTVILLE
KIRKLAND LAKE
LABRADOR CITY
MAGOG
MONTMAGNY
RIVIÈRE-DU-LOUP
SIMCOE
SMITHS FALLS
THOMPSON
GASPÉ

PUBLIC LIBRARY USAGE (1972)

ASPECT MEASURED	Although other passive leisure pursuits such as watching television and reading newspapers receive more attention from many Canadians, the reading of books continues to be a primary form of relaxation. A national survey of Canadians' leisure activities in 1975 showed that more people regularly read books during their free time than participated in arts, crafts, photography or other hobbies. On a national basis, reading books was only a slightly less popular pastime than perusing magazines.	Public library usage measures the number of books borrowed annually from public libraries, per 1000 population. Loans reflect both the availability of library books and libraries, as well as the extent to which they are used by the public. Since the indicator comprises municipal and regional libraries only, it is primarily a measure of interest in leisure reading by the general public. Books related to work activities, which are borrowed from universities, research institutions and the private collections of corporations or government departments, are excluded from the calculations.
DIFFICULTIES OF INTERPRETATION	The measure considers only those who are residents of the municipality in which the library is located. The exclusion of the population in the regional catchment areas from the calculations may cause some upward bias in the results for selected cities. As a consequence, comparisons between regions should be stressed, rather than detailed comparisons between individual cities. As was noted, data from other types of library facilities are not included. The lack of data on usage for military towns (e.g., Petawawa) may, as an example, suggest that personnel have alternative sources of reading material on the defence base. Estimates suggest that the coverage error for central libraries was approximately 14 per cent.[15] The level of error varied considerably from one province to another.	

[15]Health and Welfare Canada, *National Study on the Supply of Sports and Recreation Facilities, Phase II, Inventory of Socio-Cultural Facilities, Final Technical Report* (Ottawa: Fitness and Amateur Sport Branch, December 1974), p. 46.

RBAN PATTERN

Considerable variation is evident, by city and by region, as indicated by the large range nationally and by the high standard deviations in all regions. The availability and usage of public libraries are high in Prairie and B.C. centres, about average in Ontario cities, low in Maritime communities and very low in Québec. The borrowing of books from libraries does not differ significantly between cities of different size or growth rates, nor does library usage change systematically in relation to the relative location of the city (i.e., the degree of isolation from or distance to the nearest large centre).

The utilization of library facilities does vary, however, according to selected socio-demographic attributes of those residing in medium-sized communities. Public library usage tends to be higher than average in centres with a large elderly population (e.g., Penticton, Vernon, Lindsay). Presumably, the retired elderly population in these cities opt for less vigorous pursuits such as reading during their greatly expanded leisure time and, therefore, tend to increase the level of utilization of local libraries. Also, there is a tendency for cities with a less educated population to have lower library usage, thus suggesting that the level of educational attainment influences the amount of time and effort devoted to reading, not purely for information but for pleasure as well.

a) Overall aggregate values — Book loans per 1000 population

Mean ($\bar{X}$)	7151
Standard deviation (S)	6589
Maximum	29969
Minimum	0

b) By region

	$\bar{X}$	S	N
Atlantic	6340	5252	16
Québec	3490	5032	20
Ontario	7866	5419	32
Prairies	12274	10242	11
British Columbia	8589	6666	14

OTHER MEASURES

Alternatives consist of (1) the range of choice in library services available to residents, (2) more refined indicators of library usage, and (3) supply and demand measures for similar types of passive leisure-time pursuits. Concerning the supply of library facilities, measurement options range from the straightforward, such as book holdings in the public library or books for loan through schools and research institutions, to the more refined, such as documentation of other library resources and services: films, tapes, microfiche, periodicals and reference assistance.[16]

If further survey information were readily available at the scale of the urban centre, measures of library usage could be devised to answer the questions: "How much?" and "By whom?"[17] An indication of the mean proportion of leisure time spent reading books could be devised from time-use data. Also possible are measures depicting the socio-demographic profiles of library users according to characteristics such as age, education and occupational status.

A final category of optional measures encompasses the supply and demand or usage of time and resources for substitutes to the reading of library books. Included are measures like the average proportion of time devoted to watching television, glancing at newspapers or reading magazines. Other indicators of this type are average consumer expenditures on magazines and books.

[16]Information on book holdings, the number of children's books and types of periodicals at each library was collected during the socio-cultural facilities survey; another source of data is Statistics Canada, Education, Science and Culture Division, *Public Libraries in Canada,* Cat. 87-651 (Ottawa: 1978), (formerly Cat. 81-205).

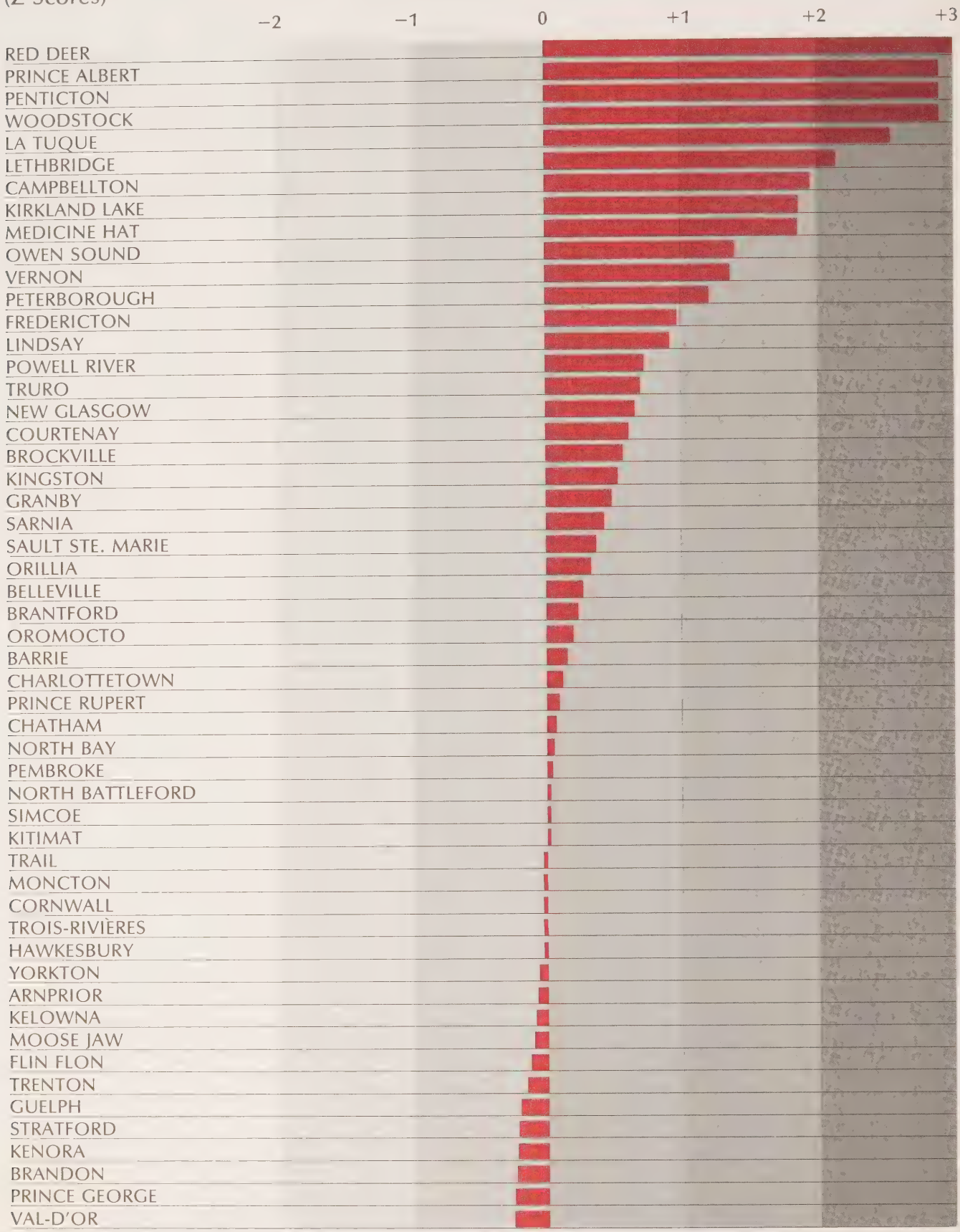
[17]At the national scale, some answers to these questions will be available from: Statistics Canada, Education, Science and Culture Division, *Survey of Fitness, Physical Recreation and Sport* (Ottawa: 1976); and Statistics Canada, Education, Science and Culture Division, *Survey of Leisure Time Activities and Reading Habits* (Ottawa: 1978).

TABLE 27. PUBLIC LIBRARY USAGE: BOOKS LOANED PER 1000 POPULATION (1972)

ATLANTIC REGION	Bathurst	3404	Moncton*	7070
	Campbellton*	19672	Newcastle*	917
	Charlottetown*	7561	New Glasgow*	10979
	Corner Brook	2915	Oromocto	8030
	Edmundston	3271	Summerside*	1980
	Fredericton*	13198	Sydney*	2447
	Grand Falls*	4759	Sydney Mines*	+
	Kentville*	1431	Truro*	11471
	Labrador City*	2198		
QUÉBEC REGION	Alma	660	Rivière-du-Loup	+
	Asbestos*	4003	Rouyn*	4813
	Baie-Comeau*	1283	Saint-Georges*	+
	Cowansville	2937	Saint-Hyacinthe*	+
	Dolbeau*	+	Saint-Jean*	2251
	Drummondville*	2125	Saint-Jérôme*	+
	Gaspé	+	Sept-Îles	4146
	Granby*	9684	Shawinigan*	3518
	Joliette*	1893	Sherbrooke*	1083
	Lachute*	2418	Sorel*	1706
	La Tuque	24446	Thetford Mines*	+
	Magog*	+	Trois-Rivières*	6590
	Matane	1864	Val-d'Or*	4885
	Montmagny	+	Valleyfield*	+
	Rimouski*	1541	Victoriaville*	1947
ONTARIO REGION	Arnprior*	6286	Midland*	4410
	Barrie*	7950	North Bay	7502
	Belleville	8859	Orillia	8869
	Brantford*	8647	Oshawa*	3012
	Brockville	10459	Owen Sound	16670
	Chatham	7606	Pembroke*	7445
	Cobourg*	4393	Petawawa*	4
	Cornwall	6651	Peterborough*	15284
	Guelph*	5929	Sarnia*	9327
	Haileybury*	+	Sault Ste. Marie*	9116
	Hawkesbury*	6562	Simcoe	7369
	Kapuskasing	4628	Smiths Falls*	4824
	Kenora*	5489	Stratford	5848
	Kingston*	10374	Timmins*	4664
	Kirkland Lake	18938	Trenton*	6159
	Leamington	+	Wallaceburg	966
	Lincoln	3221	Woodstock	27334
	Lindsay	12595		
PRAIRIES REGION	Brandon	5401	Portage la Prairie	+
	Flin Flon*	6173	Prince Albert	27858
	Grande Prairie	+	Red Deer	29969
	Lethbridge	21420	Swift Current	4191
	Medicine Hat*	18801	Thompson	1311
	Moose Jaw	6192	Yorkton	6307
	North Battleford*	7381		
BRITISH COLUMBIA REGION	Chilliwack*	+	Port Alberni*	4349
	Courtenay*	10684	Powell River	11667
	Cranbrook	+	Prince George*	5041
	Dawson Creek	4711	Prince Rupert*	7615
	Kamloops*	3989	Terrace*	3862
	Kelowna*	6279	Trail*	7129
	Kitimat	7350	Vernon	15899
	Nanaimo*	+	Williams Lake*	3073
	Penticton	27778		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Health and Welfare Canada. *A Network of Social Security Information Resources (ANSSIR) Data Bank*, special tabulation, 1977. Derived from: Health and Welfare Canada, *National Study on the Supply of Sports and Recreation Facilities*, Phase II (Ottawa, Fitness and Amateur Sports Branch: 1974).

GRAPH 25. PUBLIC LIBRARY USAGE: BOOKS LOANED PER 1000 POPULATION (1972)
(Z Scores)

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SMITHS FALLS
ROUYN
GRAND FALLS
DAWSON CREEK
TIMMINS
KAPUSKASING
MIDLAND
COBOURG
PORT ALBERNI
SWIFT CURRENT
SEPT-ÎLES
ASBESTOS
KAMLOOPS
TERRACE
SHAWINIGAN
BATHURST
EDMUNDSTON
LINCOLN
WILLIAMS LAKE
OSHAWA
COWANSVILLE
CORNER BROOK
SYDNEY
LACHUTE
SAINT-JEAN
LABRADOR CITY
DRUMMONDVILLE
SUMMERSIDE
VICTORIAVILLE
JOLIETTE
MATANE
SOREL
RIMOUSKI
KENTVILLE
THOMPSON
BAIE-COMEAU
SHERBROOKE
WALLACEBURG
NEWCASTLE
ALMA

ASPECT MEASURED

The exhibit area per 1000 population of exhibition halls, museums and art galleries in a community provides an indication of residents' potential for local exposure to displays of natural history, cultural heritage, technological achievements and artistic endeavours. Whether the displays involve paintings or pioneer utensils, murals or minerals, furniture or fashion, they are viewed for a variety of purposes, including education, information and entertainment. The enhanced awareness of local history and increased appreciation of the arts that are made possible through the availability of cultural facilities can contribute to people's quality of life.

More specifically, the facility types are operationally defined as follows:
a) exhibition hall: an area used for a limited time to exhibit collections of works or objects for promotional purposes (e.g., automobiles, sports equipment, fashion shows). Arenas, however, are excluded;
b) museum: a public exhibition area for historical artifacts or specialized displays of particular aspects of culture, art, science and technology. Museum types included were art, history, natural sciences, zoos, aquariums, botanical gardens, experimental farms, technology, planetariums, automotive, armed forces, historic monuments, forts, old homes and religious sanctuaries;
c) art gallery: an area specializing in the public exhibition of art objects.[18]

In each case, only the interior public display space is considered. Outdoor exhibit areas and building space devoted to storage, administration and other purposes are excluded.

DIFFICULTIES OF INTERPRETATION

Cultural facilities of significant size and importance may attract a substantial number of visitors from the surrounding region, and also from further afield during the tourist season. But, since the delimitation of the service area for each facility located in the centres under study cannot be determined with existing information, the measure exhibit area per 1000 population was estimated with reference to only the population of the municipality of census agglomeration in which the facility is located. As a result, the measure is an overestimate of the level of facility provision to the local population by the extent to which patrons of the various establishments are drawn from "outside" the host city. Consequently, the measure indicates broad trends only rather than detailed comparisons between pairs of centres.

Estimates suggest that an error of coverage of approximately 20 per cent was committed in regard to museums, art galleries and selected exhibition areas. Coverage of private and municipal facilities was relatively more complete than that accorded to provincial government and university facilities.[19]

[18]Health and Welfare Canada, *National Study on the Supply of Sports and Recreation Facilities, Phase II, Inventory of Socio-Cultural Facilities, Final Technical Report* (Ottawa: Fitness and Amateur Sport Branch, December 1974), pp. 51-52.

[19]*Ibid*, p. 46.

Substantial differences in facility provision exist between regions and between cities. The broadest array of opportunities for viewing cultural displays is available to those residing in Prairie communities, while ample opportunity for experiencing their cultural heritage is also afforded to the residents of medium-sized Ontario cities. Exhibit area is more limited in Québec and Atlantic communities and least available in B.C. centres.

More significant than differences in regional averages, however, are the sizeable variations in display space between cities, as evidenced by the high range (7373) and the extreme coefficient of variations (S/X = 2.2). Moreover, the geographic distribution of exhibit space among smaller cities fails to conform, in large part, to the broad market forces of Canada's regional space economy. City size, for example, is not correlated with the extent of exhibit area provided. This apparent randomness in the spatial distribution of museums, galleries and exhibit halls largely stems from the unique nature and location of the historical events which many of these establishments commemorate. Places with large-sized museums are often the site of significant historic happenings: Midland, which houses the Indian Village, Ste. Marie among the Hurons; Kingston, which is the site of the Old Fort Henry museum; and Charlottetown, which hosted the Confederation Conference of 1864.

Quite apart from the historic significance of cities, the provision of exhibit areas and the opening of galleries to display high-order luxury items that are less subject to the dictates of normal market forces may largely reflect the calculated risk-taking of local businessmen. Such individual initiatives based on entrepreneurial acumen may also serve to introduce an element of randomness into the spatial pattern of exhibit area provision.

Despite the unique aspects of the geographic pattern, several general tendencies are also discernible. Cities situated near major metropolitan centres offer few exhibit facilities (e.g., Saint-Hyacinthe, Saint-Jean and Valleyfield), presumably because their residents visit the more attractive and specialized museums and galleries found in the metropolis. By contrast, major market and retail distribution centres which are situated some distance from the nearest metropolitan areas tend to have a sizeable inventory of exhibit space (e.g., Lethbridge, Medicine Hat, Grande Prairie and Kamloops).

Differences in educational levels and occupational structure between centres also seem to coincide with the availability of exhibit space. Many cities oriented to primary production, which, therefore, have a larger "blue collar" labour force, contain few museums, galleries or cultural display areas (e.g., Sydney Mines, Asbestos, La Tuque, Thetford Mines, Hawkesbury and Trail). Conversely, centres whose raison d'être is government administration or university education, and which, consequently, have a more educated "white collar" labour force, often possess a wider than average array of cultural facilities (e.g., Charlottetown, Fredericton and Kingston). Possibly due to the transient nature of the population, most of the military towns are lacking in museums, galleries and specific exhibit areas.

a) Overall aggregate values	Display space (square metres)
Mean ($\bar{X}$)	40.3
Standard deviation (S)	89.8
Maximum	684.9
Minimum	0.0

b) By region	$\bar{X}$	S	N
Atlantic	37.8	44.2	16
Québec	30.6	64.1	30
Ontario	47.0	116.9	35
Prairies	81.8	139.4	13
British Columbia	14.3	12.2	17

OTHER MEASURES

Alternative measures consist of both supply indicators and demand indicators. Refined measures of facility provision may include additional indicators of quantity such as type of works exhibited, number of works owned,[20] wall area used for display purposes, outdoor exhibit area, hours of operation for the facility and the frequency with which exhibitions are held. An additional listing of museums, art galleries and cultural exhibition facilities within municipalities across Canada is also available from Stastistics Canada.[21] Also, given that museums, galleries and other exhibit areas provide high-order goods and services which many patrons will periodically travel a considerable distance to see, a more realistic reflection of residents' access to cultural facilities may be provided by an index that includes all exhibit areas within a one-hour driving distance of the city.

Measures of demand for cultural facilities are primarily based on attendance levels at the various facilities. If the data are collected, participation measures may be extended by the creation of socio-demographic profiles of patrons according to age, education, occupation and other attributes. Another variable of importance is the home address of those who visit cultural facilities. This information would subdivide participants into local demand and tourist demand, thus allowing the creation of more valid measures of facility provision.

[20]Information on type of works exhibited and number of works owned was collected for art museums and art galleries during the survey of socio-cultural facilities. See the final technical report.

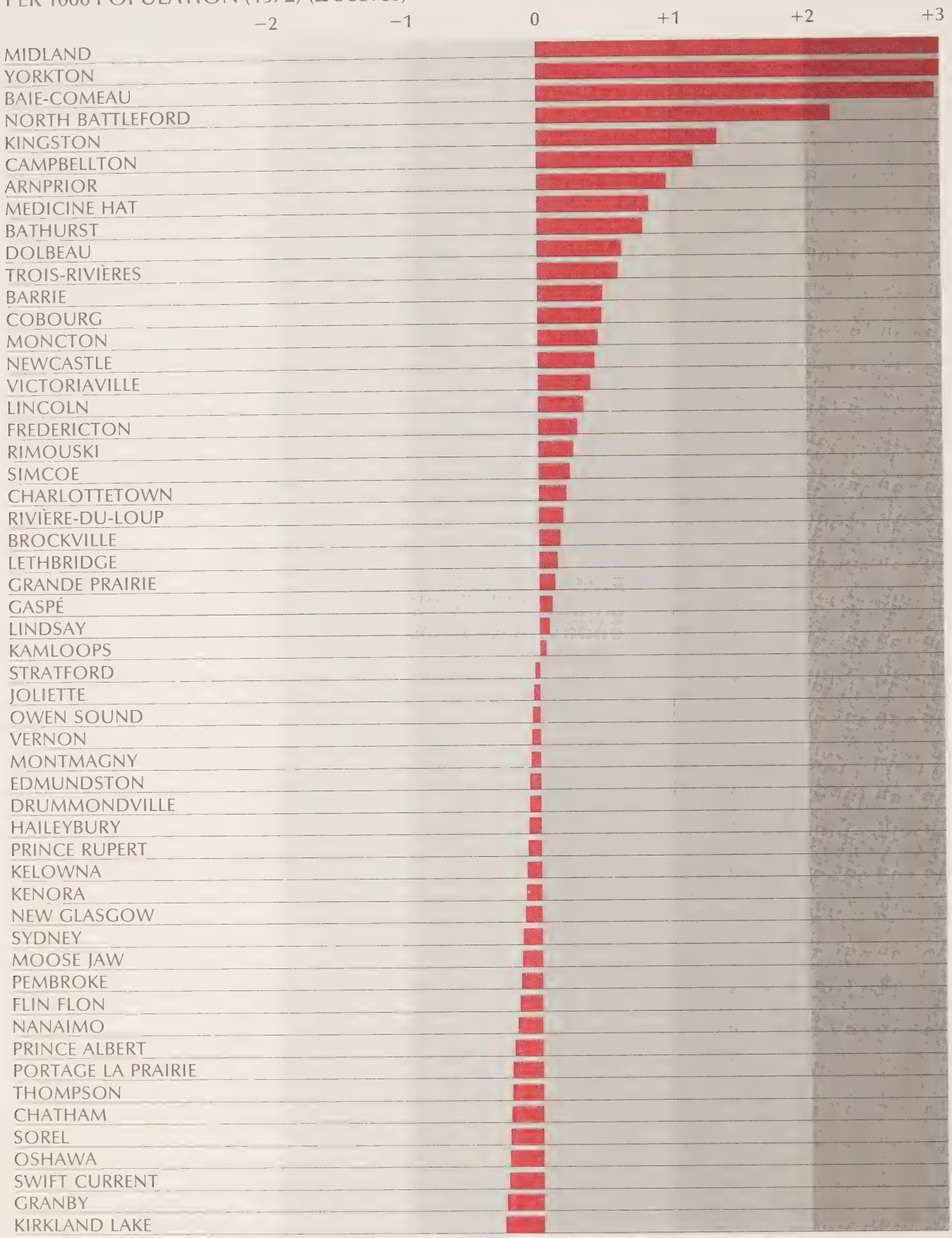
[21]Statistics Canada, Education, Science and Culture Division, *Museums and Art Galleries*, Cat. 87-635 (Ottawa: 1978) (formerly Cat. 81-534).

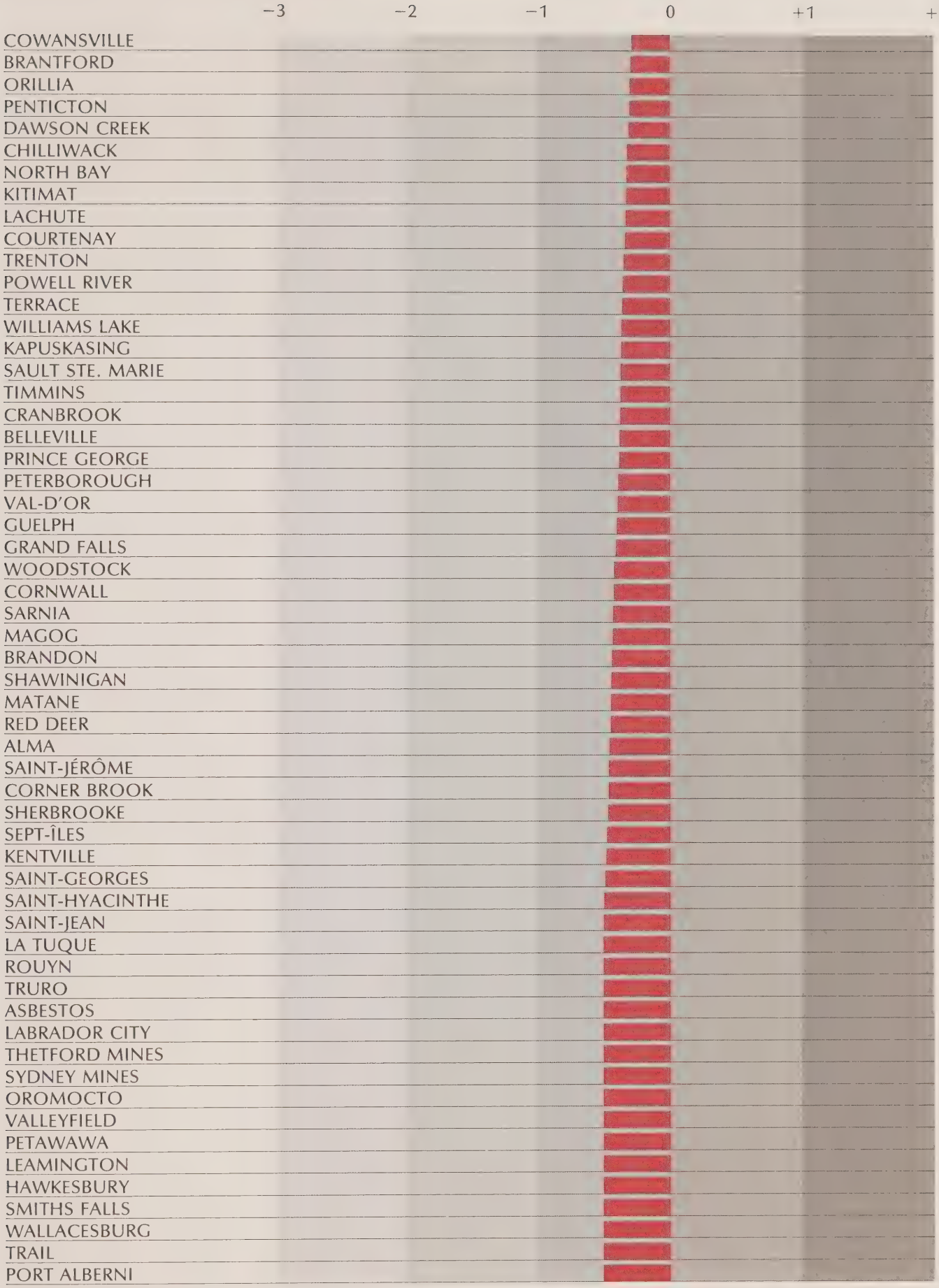
TABLE 28. EXHIBITION HALLS, MUSEUMS AND GALLERIES: EXHIBIT AREA (SQUARE METRES) PER 1000 POPULATION (1972)

ATLANTIC REGION	Bathurst	107.5	Moncton*	74.4
	Campbellton*	144.1	Newcastle*	69.8
	Charlottetown*	56.8	New Glasgow*	26.1
	Corner Brook	2.0	Oromocto	0.0
	Edmundston	30.4	Summerside*	+
	Fredericton*	61.8	Sydney*	24.0
	Grand Falls*	4.5	Sydney Mines*	0.0
	Kentville*	0.8	Truro*	0.0
	Labrador City*	0.0		
QUÉBEC REGION	Alma	2.25	Rivière-du-Loup	55.9
	Asbestos*	0.0	Rouyn*	0.0
	Baie-Comeau*	338.8	Saint-Georges*	0.0
	Cowansville	14.8	Saint-Hyacinthe*	0.0
	Dolbeau*	89.2	Saint-Jean*	0.0
	Drummondville*	30.4	Saint-Jérôme*	2.1
	Gaspé	44.7	Sept-Îles	1.1
	Granby*	15.8	Shawinigan*	3.0
	Joliette*	38.8	Sherbrooke*	1.3
	Lachute*	9.8	Sorel*	17.4
	La Tuque	0.0	Thetford Mines*	0.0
	Magog*	3.9	Trois-Rivières*	86.4
	Matane	2.4	Val-d'Or*	5.0
	Montmagny	32.6	Valleyfield*	0.0
	Rimouski*	59.0	Victoriaville*	64.7
ONTARIO REGION	Arnprior*	122.4	Midland*	685.0
	Barrie*	78.7	North Bay	10.9
	Belleville	5.0	Orillia	14.1
	Brantford*	14.7	Oshawa*	16.8
	Brockville	54.8	Owen Sound	38.5
	Chatham	17.7	Pembroke*	20.9
	Cobourg*	77.9	Petawawa*	0.0
	Cornwall	4.0	Peterborough*	5.0
	Guelph*	4.9	Sarnia*	4.0
	Haileybury*	30.4	Sault Ste. Marie*	5.6
	Hawkesbury*	0.0	Simcoe	58.6
	Kapuskasing	5.7	Smiths Falls*	0.0
	Kenora*	26.4	Stratford	40.0
	Kingston*	160.3	Timmins*	5.5
	Kirkland Lake	15.0	Trenton*	9.5
	Leamington	0.0	Wallaceburg	0.0
	Lincoln	63.4	Woodstock	4.5
	Lindsay	43.5		
PRAIRIES REGION	Brandon	3.3	Portage la Prairie	18.4
	Flin Flon*	20.2	Prince Albert	19.6
	Grande Prairie	49.4	Red Deer	2.2
	Lethbridge	51.4	Swift Current	16.7
	Medicine Hat*	110.1	Thompson	17.9
	Moose Jaw	23.6	Yorkton	495.5
	North Battleford*	235.1		
BRITISH COLUMBIA REGION	Chilliwack*	11.9	Port Alberni*	0.0
	Courtenay*	9.6	Powell River	8.1
	Cranbrook	5.1	Prince George*	5.0
	Dawson Creek	12.7	Prince Rupert*	28.3
	Kamloops*	40.7	Terrace*	7.3
	Kelowna*	27.3	Trail*	0.0
	Kitimat	10.6	Vernon	35.1
	Nanaimo*	19.9	Williams Lake*	6.1
	Penticton	13.9		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
+Data not available.
SOURCE: Health and Welfare Canada, *A Network of Social Security Information Resources (ANSSIR) Data Bank,* special tabulation, 1977. Derived from: Health and Welfare Canada, Fitness and Amateur Sports Branch, *National Study on the Supply of Sports and Recreation Facilities, Phase II* (Ottawa: 1974).

GRAPH 26. EXHIBITION HALLS, MUSEUMS AND GALLERIES: EXHIBIT AREA (SQUARE METRES) PER 1000 POPULATION (1972) (Z Scores)

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COWANSVILLE
BRANTFORD
ORILLIA
PENTICTON
DAWSON CREEK
CHILLIWACK
NORTH BAY
KITIMAT
LACHUTE
COURTENAY
TRENTON
POWELL RIVER
TERRACE
WILLIAMS LAKE
KAPUSKASING
SAULT STE. MARIE
TIMMINS
CRANBROOK
BELLEVILLE
PRINCE GEORGE
PETERBOROUGH
VAL-D'OR
GUELPH
GRAND FALLS
WOODSTOCK
CORNWALL
SARNIA
MAGOG
BRANDON
SHAWINIGAN
MATANE
RED DEER
ALMA
SAINT-JÉRÔME
CORNER BROOK
SHERBROOKE
SEPT-ÎLES
KENTVILLE
SAINT-GEORGES
SAINT-HYACINTHE
SAINT-JEAN
LA TUQUE
ROUYN
TRURO
ASBESTOS
LABRADOR CITY
THETFORD MINES
SYDNEY MINES
OROMOCTO
VALLEYFIELD
PETAWAWA
LEAMINGTON
HAWKESBURY
SMITHS FALLS
WALLACESBURG
TRAIL
PORT ALBERNI

Concern about crime looms large in the minds of many Canadians. Residents worry about the safety of their children, avoid troubled areas of the city after dark, endeavour to protect their homes, businesses and belongings in a variety of ways. Increased patrols, more charges laid and longer prison terms for offenders are often demanded of the police and the courts by some members of the Canadian public. A safe, secure environment is a necessary condition for a satisfactory quality of life, and many urban Canadians perceive, correctly or otherwise, that their streets, homes and families are not particularly safe.

Statistics on the incidence of reported criminal activity in Canada are not reassuring. Over the 1964-74 period, crime rates for the country as a whole rose steadily. For some types of offences, such as robbery, the rate nearly tripled, while for many other crimes, including murder, rape, assault, theft, and break and enter, reported occurrences more than doubled.[22] Some solace may be sought in the fact that the *rate* of increase in reported criminal offences lessened nationwide over the ten-year period. Nevertheless, it may prove disconcerting for many urban dwellers to find out that crime rates in smaller centres are slowly approaching those of centres having 100 000 population or more. From 1964-74, the most significant upsurge in criminal activity was recorded in places having 50 000 population or less.

Explanations for the increase in crime are many and varied. Although precise causes are not known, there are aspects of urban life that seem to exacerbate criminal activity. The sheer size of a city and the complexity of its business, institutional and social activities may cause a heightened sense of tension and anxiety as well as anonymity and alienation in some residents, thus creating a state of mind under which more crimes are likely to be committed. In addition, the lack of informal social controls such as strong kinship networks and parental supervision, which traditionally are viewed as the hallmark of less complex societies, may contribute to increasing rates of delinquency among the young. The persistence and pervasiveness of urban poverty also influence criminal activity. The lack of success experienced by some residents and the sense of social inequality that they may feel may prompt the economically deprived to attempt to achieve their goals through illegitimate means.

Whatever the causes, criminal activity is deleterious to community life in many ways, some of which are obvious, others of which are hidden. In an economic sense, crime is expensive. Apart from financial losses incurred through robbery, theft, shoplifting and vandalism, public expenditures for police protection and the court system are continually escalating. Actual criminality and the perceived threat of criminal action are also costly in a social sense. Interaction among residents and the potential enjoyment of public plazas, vistas, parks and streets may be foregone as people begin to perceive such places as unsafe. In a psychological sense, crime may have an insidious impact on individuals and communities, from the severe trauma experienced by victims of violent crime to the milder fears expressed by residents who attempt to make their homes secure by the purchase of alarms, elaborate locks and, in extreme cases, firearms.

In summary, the level of criminal activity in a community bears a significant relationship to public safety, the perceived degree of risk and the quality of life for most residents. Three measures of crime are provided: violent crimes, serious property crimes and robberies.

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[22]Statistics Canada, *Perspective Canada II* (Ottawa: 1977), pp. 295-300.

TECHNICAL NOTES

The measures presented are derived from unpublished tabulations obtained from the Judicial Division, Statistics Canada. The information is collected through the Uniform Crime Reporting System, initiated in 1962 and revised in 1974 and 1977 by Statistics Canada in cooperation with the Canadian Association of Chiefs of Police. Under this system, police departments send monthly crime statistics returns in a standardized format (form C) to Statistics Canada.

Not all categories and sub-totals of crimes that municipal police departments routinely tabulate and forward to Statistics Canada are summarized in this set of indicators. Crime statistics are beset with many problems. As a consequence, there are a number of factors to be kept in mind when selecting crime indicators or interpreting criminal offence rates over time or across communities. The most important of these are (1) level of reporting, (2) rigour of enforcement, (3) differences in legal statutes, and (4) relation to public safety. Each is discussed in turn.

First, a serious discrepancy exists between crimes committed and crimes reported to police, and reporting rates differ by type of offence. The true relationship between crimes known to police and actual crimes committed is unknown. However, some estimates have been made on the basis of victimization surveys and self-reported crime surveys. One study estimates the actual level of crime committed to be double the rate of offences reported to police.[23]

Many factors affect the reporting rate of offences. Some of these include (1) public perception of a crime, which is linked to the seriousness of the offence, (2) the victim's perception of negative sanctions (e.g., rape cases) or inconvenience arising from reporting an accident (i.e., loss of time, court appearances, cross-examination), (3) public perception of police effectiveness in resolving crime, together with the diligence of authorities in recording events and the problem of internal transfer of records in which the character of an event reported can change.

Because of these factors, development of crime indices was restricted to criminal code offences of violence and major property crimes which are viewed as serious by the public and are, therefore, reported more consistently. Omitted were offences such as theft under $200, minor shoplifting, etc., which are perceived as relatively less serious by the public and, hence, suffer from wider variation in the level of reporting.

Second, for many types of crime, the level of offences recorded in a community varies directly with the rigour of enforcement by local authorities. Certain provisions are generally not enforced unless there is a citizen complaint or a political directive to crack down. As a result, municipal bylaws, provincial statutes and so-called "victimless" crimes, subject to the moral turpitude of the day, are not among the measures presented.

[23]Bell, Rowbotham and Boydell, "Deviant Behaviour and Societal Reaction", in C.L. Boydell, C.F. Grindestaff and P.C. Whitehead (eds.), *Crime in Canada: A Distributional Analysis* (Toronto: Holt, Rhinehart and Winston, 1972), p. 96.

Third, legal statutes vary from province to province and bylaws from municipality to municipality in order to cope with regional and local circumstances. Definitional differences in bylaws were avoided by focussing on criminal code offences defined on a national basis and recorded by municipal police departments in standardized terms. In this manner, comparability between places was ensured.

Finally, the focus is on crimes perceived by the populace as most significantly related to public safety, level of risk and quality of community life in general. Although many federal and provincial statutes and municipal bylaws facilitate orderly transactions and predictable behaviour (e.g., customs and excise regulations, bankruptcy act and parking bylaws), they are not directly germane to community safety and are, therefore, omitted from the indicator set.

In sum, then, the indicators selected possess the following desirable attributes: focus on most serious crimes; consistently high level of reporting; crimes with victims, not subject to variations in enforcement; uniform legal definition throughout Canada; perceived as significantly related to public safety.

Detailed calculation of the crime indices involves a number of specific considerations of temporal and geographic coverage. Crime data are available on an annual basis. In order to reduce the variance in the rates of crime experienced, particularly for relatively rare crimes in smaller communities, a three-year average (1973-1975) was adopted. A longer time period was avoided as it would have tended to increase the problem of definitional changes in various crimes and thus reduce comparability.

Problems of geographic coverage must also be noted. Correspondence between police jurisdictions by which the data are collected and the boundaries of the census agglomerations is not precise. In CAs where data were unavailable for some component parts, the population base was adjusted accordingly during calculation of crime rates per 1000 population. The total inventory of recorded illicit activity in each city is, nevertheless, under-reported. Criminal actions dealt with by the RCMP and provincial police departments in Ontario and Québec and by the harbour police are not included because the regional districts policed by these units do not coincide with community boundaries.

VIOLENT CRIME

ASPECT MEASURED	Crimes of violence, though committed less frequently than other forms of crime, weigh most heavily on the public mind. The high degree of attention accorded to occurrences of of violent crime is understandable since crimes against the person represent a direct threat to life and limb. Crimes of violence comprise homicides, including attempted murder and manslaughter, sexual offences, assault causing wounding or bodily harm, and robbery involving stealing with violence, threat of violence or stealing while armed.[24]	Though on the increase, the incidence of violent crime nationwide did not rise as rapidly as the rates experienced for serious property crime or for all criminal code offences during the 1973-75 period. For Canada as whole, violent crime increased 11.4 per cent over the three-year time span, escalating from 5.33 to 5.94 occurrences per 1000 population. Calculation of the measure involves the aggregation of offences committed in each category for the three-year period, with subsequent division by three to derive the yearly average. Rates per 1000 population were then computed.
DIFFICULTIES OF INTERPRETATION	Calculation of crime rates for the general community population size must be considered relatively crude since offence rates for various types of crime are known to vary by socio-demographic group (i.e., age, sex, income, education, ethnicity) and, as a consequence, by geographic area within the city. Moreover, due caution should be taken in drawing direct comparisons between cities since the amount and type of crime can be affected by the density and size of the community population as well as by the relative stability of population (i.e., the proportion of commuters, seasonal workers and other transients). Hence, city specific comparisons should give way to determination of deviations from national and provincial averages or be restricted to comparisons among cities exhibiting similar socio-economic conditions (i.e., standardized by socio-demographic attributes).	Due heed must also be accorded to the problem of ecological fallacy, the imputing of aggregate trends to individuals. The crime indices represent the overall level of unlawful activity reported in a city more than they reflect the likelihood of crimes committed against any single individual. Finally, difficulties in interpreting the criminal code indices may arise from the aggregation of crimes of differing gravity. Although few would argue that assaults and homicides are of identical importance to public safety or the quality of life, these offences are weighted equally within the violent crime index. Weighted indices are available, but these are neither fully accepted nor sufficiently refined to warrant their use.[25] Accordingly, interpretation of the composite indices should focus primarily on the volume rather than the seriousness of criminal activity.

[24]For detailed definitions of each offence, the reader is referred to Statistics Canada, *Crime and Traffic Enforcement Statistics,* Cat. 85-205 (Ottawa: August 1977), pp. 19-31.

[25]For example, the Sellin-Wolfgang index.

URBAN PATTERN

For the most part, the rate of violent crimes known to police increases successively from east to west across Canada. Regionally, the highest levels of violent crimes were recorded in B.C. communities, with the average crime rates in Prairie and Ontario centres trailing not far behind. The lowest levels of violent crime were reported in Québec and Maritime cities. Variation between cities in the occurrence of violent crime was greater in Ontario and western centres than in the communities of Eastern Canada.

Rates for crimes of violence do not differ systematically by population size or rate of growth for medium-sized centres. However, there is some tendency for acts of violence to occur with greater frequency in high-income communities. Centres whose residents enjoy a high level of income after taxes also experienced a higher incidence of violent crime.

Perhaps due to their recent development, the formative nature of their social structure or the degree of isolation experienced by their residents, some northern resource and transportation centres report higher than average levels of violent crime (e.g., Sept-Îles, Kirkland Lake, Thompson, Flin Flon, North Battleford, Prince Albert, Grande Prairie, Dawson Creek and Prince Rupert). However, the regional pattern is by no means clear cut. The residents of many southern Ontario centres are also exposed to an above average incidence of violent crime (e.g., Chatham, Woodstock, Wallaceburg, Simcoe, Brantford, Belleville and Oshawa).

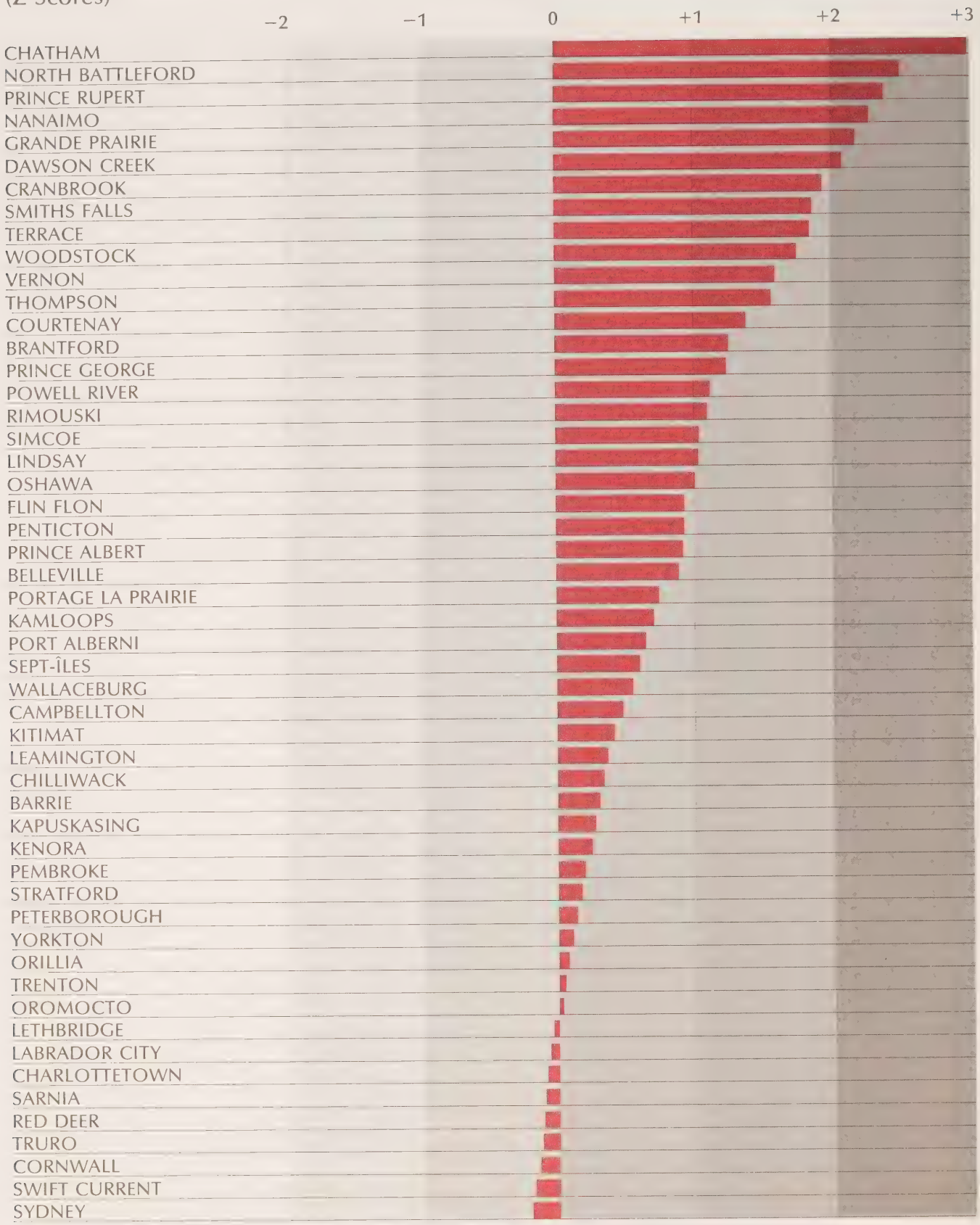
a) Overall aggregate values	Violent crimes per 1000 population		
Mean ($\bar{X}$)	5.3		
Standard deviation (S)	3.5		
Maximum	15.6		
Minimum	0.2		
b) By region	$\bar{X}$	S	N
Atlantic	3.5	1.6	16
Québec	2.4	1.4	30
Ontario	6.0	3.3	35
Prairies	7.3	3.5	13
British Columbia	9.3	2.9	16

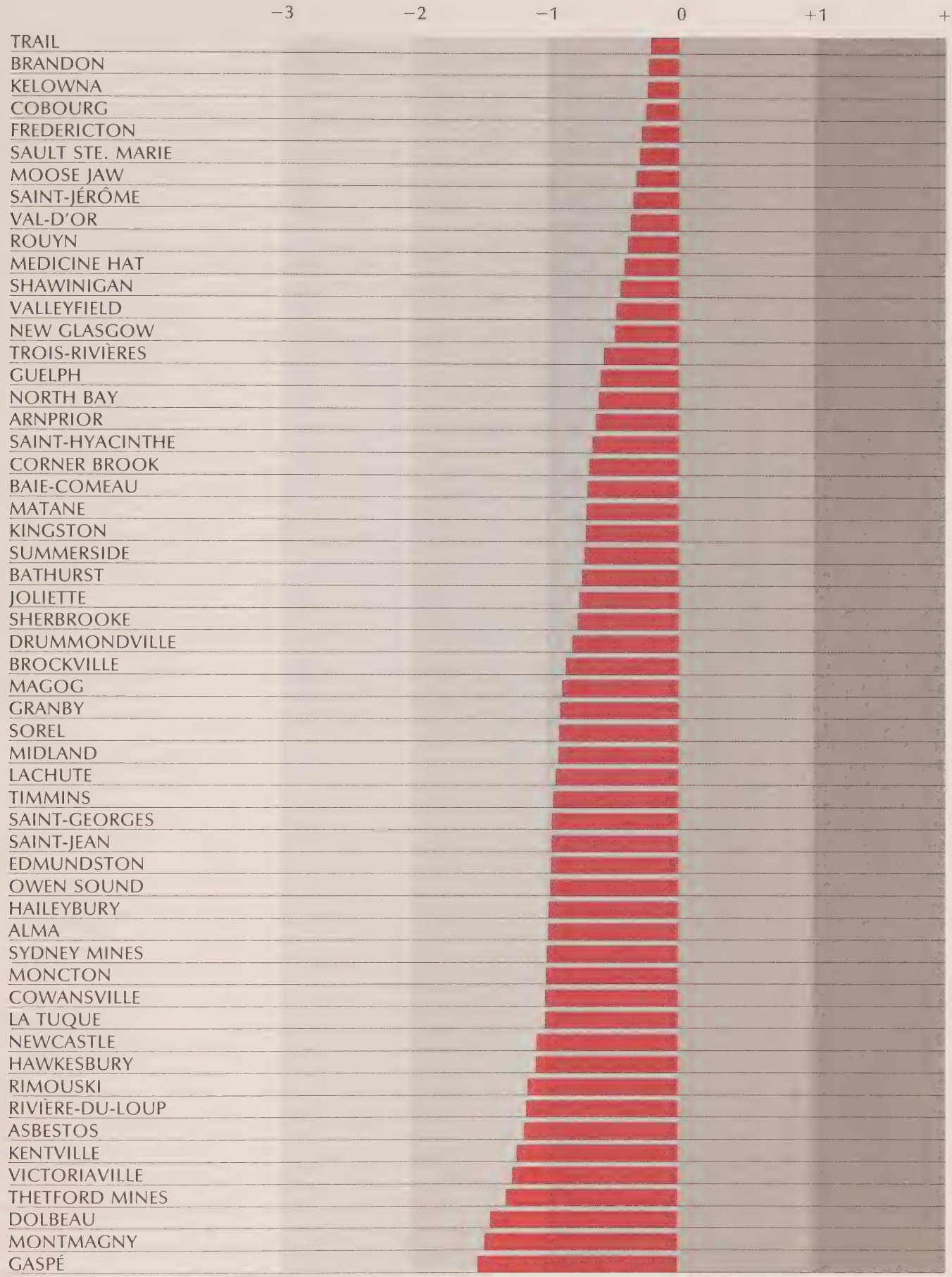
TABLE 29. VIOLENT CRIMES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)

ATLANTIC REGION	Bathurst	2.80	Moncton[b]	1.79
	Campbellton[a]	6.87	Newcastle[a]	1.60
	Charlottetown*	5.01	New Glasgow[a]	3.53
	Corner Brook	3.04	Oromocto	5.22
	Edmundston	2.10	Summerside[a]	2.90
	Fredericton[b]	4.03	Sydney[a]	4.57
	Grand Falls*	+	Sydney Mines[a]	1.87
	Kentville[a]	1.07	Truro[a]	4.93
	Labrador City[a]	5.03		
QUÉBEC REGION	Alma	1.87	Rivière-du-Loup	1.31
	Asbestos[a]	1.23	Rouyn*	3.68
	Baie-Comeau[a]	2.99	Saint-Georges*	2.20
	Cowansville	1.76	Saint-Hyacinthe[a]	3.10
	Dolbeau*	0.56	Saint-Jean[a]	2.10
	Drummondville[a]	2.70	Saint-Jérôme[a]	3.90
	Gaspé[c]	0.18	Sept-Îles	7.20
	Granby[a]	2.47	Shawinigan*	3.66
	Joliette[a]	2.73	Sherbrooke[a]	2.73
	Lachute*	2.35	Sorel[a]	2.37
	La Tuque	1.76	Thetford Mines[a]	0.90
	Magog[a]	2.53	Trois-Rivières[a]	3.40
	Matane	2.93	Val-d'Or[a]	3.81
	Montmagny	0.43	Valleyfield[a]	3.53
	Rimouski[a]	1.33	Victoriaville*	1.05
ONTARIO REGION	Arnprior[a]	3.20	Midland[a]	2.37
	Barrie*	6.41	North Bay	3.24
	Belleville	8.28	Orillia	5.58
	Brantford*	9.68	Oshawa[a]	8.83
	Brockville	2.62	Owen Sound	1.96
	Chatham[e]	15.64	Pembroke[a]	5.97
	Cobourg[a]	4.33	Petawawa*	+
	Cornwall	4.84	Peterborough[a]	5.67
	Guelph[a]	3.30	Sarnia[a]	4.97
	Haileybury[a]	1.93	Sault Ste. Marie*	3.97
	Hawkesbury[a]	1.57	Simcoe[c]	8.93
	Kapuskasing	6.31	Smiths Falls[a]	11.87
	Kenora[a]	6.30	Stratford	5.84
	Kingston[a]	2.93	Timmins[b]	2.28
	Kirkland Lake	9.27	Trenton[a]	5.43
	Leamington	6.56	Wallaceburg	7.07
	Lincoln	+	Woodstock	11.28
	Lindsay	8.92		
PRAIRIES REGION	Brandon	4.46	Portage la Prairie	7.74
	Flin Flon*	8.57	Prince Albert	8.54
	Grande Prairie[d]	12.91	Red Deer[c]	4.96
	Lethbridge	5.21	Swift Current	4.60
	Medicine Hat*	3.68	Thompson	10.60
	Moose Jaw	3.94	Yorkton	5.66
	North Battleford*	14.13		
BRITISH COLUMBIA REGION	Chilliwack*	6.50	Port Alberni[a]	7.33
	Courtenay[a]	9.97	Powell River	9.31
	Cranbrook	12.24	Prince George[b]	9.60
	Dawson Creek	12.55	Prince Rupert[a]	13.50
	Kamloops[b]	7.48	Terrace[a]	11.63
	Kelowna[a]	4.43	Trail[a]	4.53
	Kitimat	6.75	Vernon	10.72
	Nanaimo[ac]	13.25	Williams Lake*	+
	Penticton	8.55		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipal jurisdictions within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the new, enlarged municipalities, as of 1973.
[c]Data available for 1973-74 only.
[d]Data available for 1974-75 only.
[e]Data available for 1973 and 1975 only.
SOURCE: Calculations based on Statistics Canada, Justice Statistics Division, Uniform Crime Reporting, Crime Statistics, unpublished tabulations for the years 1973-75 (Ottawa, received May 1977).

GRAPH 27. VIOLENT CRIMES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)
(Z Scores)

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0
+1
+2
TRAIL
BRANDON
KELOWNA
COBOURG
FREDERICTON
SAULT STE. MARIE
MOOSE JAW
SAINT-JÉRÔME
VAL-D'OR
ROUYN
MEDICINE HAT
SHAWINIGAN
VALLEYFIELD
NEW GLASGOW
TROIS-RIVIÈRES
GUELPH
NORTH BAY
ARNPRIOR
SAINT-HYACINTHE
CORNER BROOK
BAIE-COMEAU
MATANE
KINGSTON
SUMMERSIDE
BATHURST
JOLIETTE
SHERBROOKE
DRUMMONDVILLE
BROCKVILLE
MAGOG
GRANBY
SOREL
MIDLAND
LACHUTE
TIMMINS
SAINT-GEORGES
SAINT-JEAN
EDMUNDSTON
OWEN SOUND
HAILEYBURY
ALMA
SYDNEY MINES
MONCTON
COWANSVILLE
LA TUQUE
NEWCASTLE
HAWKESBURY
RIMOUSKI
RIVIÈRE-DU-LOUP
ASBESTOS
KENTVILLE
VICTORIAVILLE
THETFORD MINES
DOLBEAU
MONTMAGNY
GASPÉ

ASPECT MEASURED

With the exception of assault, robbery is the violent crime most frequently committed in Canada and its incidence has increased rapidly in recent years. By comparison to theft, which is committed in secret, robbery involves stealing directly from the victim by means of violence or threats of violence.

Though a relatively rare crime, the occurrence of robberies jumped alarmingly on a nationwide basis during the 1973-75 period. All told, robberies reported increased from 0.60 to 0.93 offences per 1000 population over the three-year period, an unenviable 36.2 per cent rise.

Detailed calculations include the determination of the three-year average and the subsequent computation of rates per 1000 population for each community.

URBAN PATTERN

In contrast to the geographic distribution of all violent offences, incidents of robbery were, on a regional basis, above average in B.C. and Québec communities, about average in Ontario centres and below average in Prairie and Maritime cities. Within regions, variation between centres in the rate of robberies per 1000 persons was least in Prairie and Maritime centres and greatest in Québec and B.C. communities. The occurence of robberies tends to vary systematically with city size. Residents and establishments in the larger cities were more likely to be victimized by robbery (e.g., Shawinigan, Sherbrooke, Trois-Rivières, Oshawa, Guelph, Prince George and Nanaimo). That commercial establishments often fall victim to robbery is suggested in a limited way by the moderate degree of co-variation between robbery rates and the commercial activity index (i.e., level of building permits issued for medium-sized cities). Also, citizens and firms in medium-sized centres near Montrèal are more likely to be relieved of their possessions by force or threat of force (e.g., Granby, Joliette, Saint-Hyacinthe, Saint-Jean, Saint-Jérôme and Valleyfield).

On a global basis, however, the rate of robbery experienced in a community is neither consistently associated with its socio-demographic nor its economic profile. The incidence of robbery does not differ significantly with age structure, rate of population turnover, degree of educational achievement or income level of people residing in medium-sized centres.

a) Overall aggregate values — Robberies per 1000 population

Mean ($\bar{X}$)	0.3
Standard deviation (S)	0.3
Maximum	1.4
Minimum	0.0

b) By region

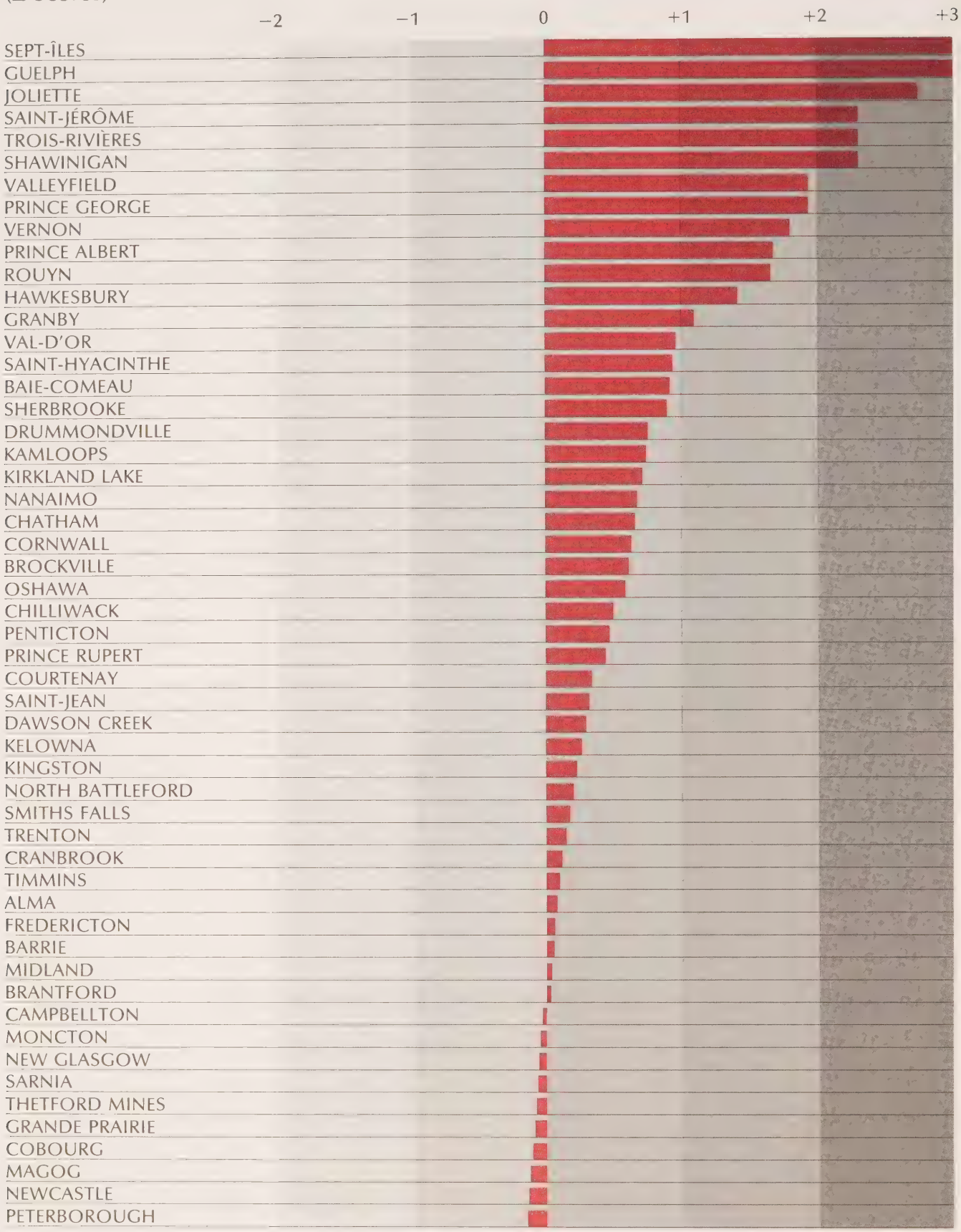
	$\bar{X}$	S	N
Atlantic	0.2	0.2	16
Québec	0.5	0.4	30
Ontario	0.3	0.3	33
Prairies	0.2	0.2	13
British Columbia	0.5	0.4	16

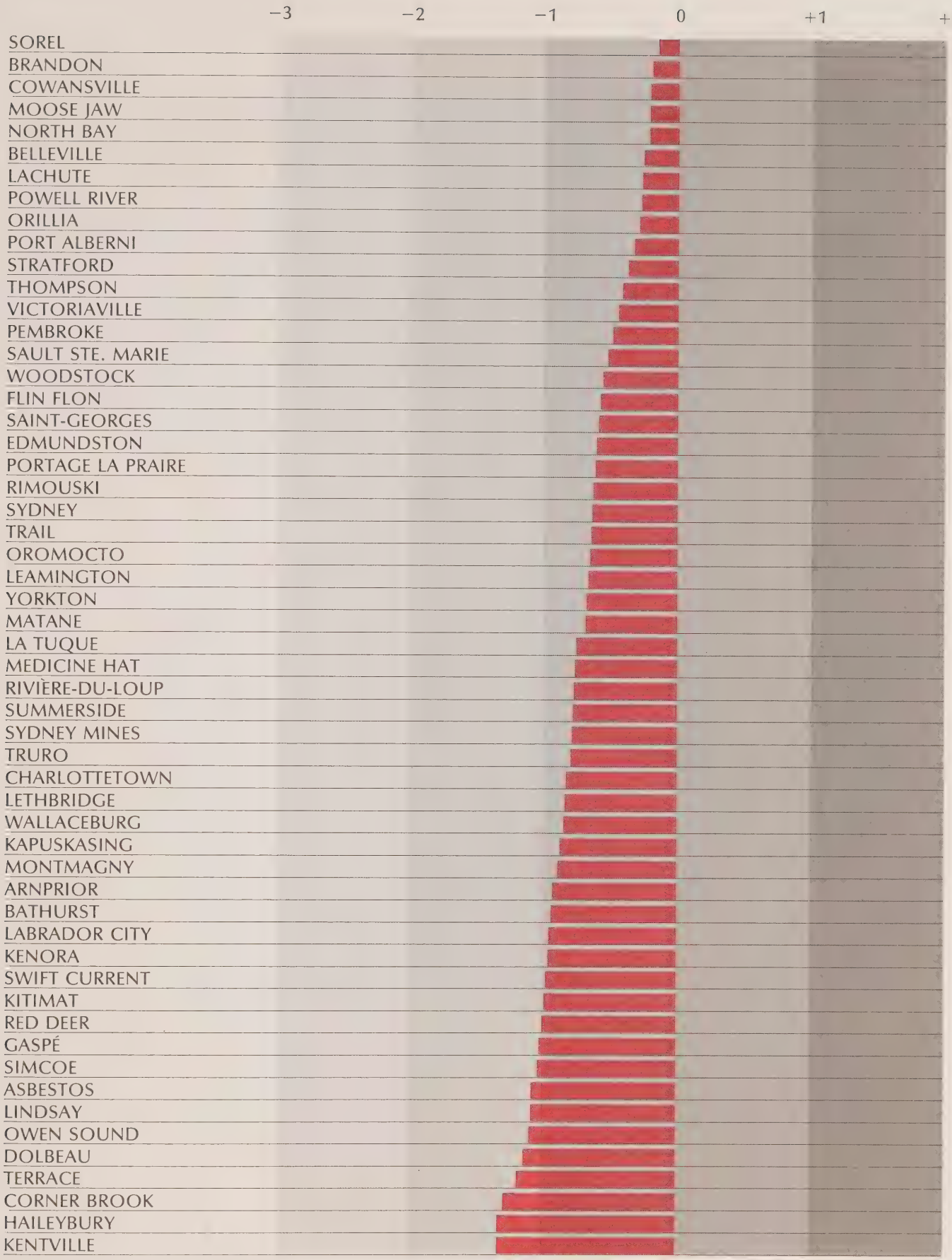
TABLE 30. ROBBERIES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)

ATLANTIC REGION	Bathurst	0.10	Moncton[b]	0.31
	Campbellton[a]	0.34	Newcastle[a]	0.30
	Charlottetown*	0.12	New Glasgow[a]	0.33
	Corner Brook	0.01	Oromocto	0.16
	Edmundston	0.18	Summerside[a]	0.13
	Fredericton[b]	0.38	Sydney[a]	0.17
	Grand Falls*	+	Sydney Mines[a]	0.13
	Kentville[a]	0.00	Truro[a]	0.13
	Labrador City[a]	0.10		
QUÉBEC REGION	Alma	0.38	Rivière-du-Loup	0.13
	Asbestos[a]	0.05	Rouyn*	0.79
	Baie-Comeau[a]	0.58	Saint-Georges*	0.19
	Cowansville	0.28	Saint-Hyacinthe[a]	0.60
	Dolbeau*	0.03	Saint-Jean[a]	0.43
	Drummondville[a]	0.53	Saint-Jérôme[a]	0.97
	Gaspé[c]	0.06	Sept-Îles	1.40
	Granby[a]	0.63	Shawinigan*	0.96
	Joliette[a]	1.10	Sherbrooke[a]	0.57
	Lachute*	0.27	Sorel[a]	0.30
	La Tuque	0.13	Thetford Mines[a]	0.33
	Magog[a]	0.30	Trois-Rivières[a]	0.97
	Matane	0.14	Val-d'Or[a]	0.62
	Montmagny	0.11	Valleyfield[a]	0.87
	Rimouski[a]	0.17	Victoriaville*	0.21
ONTARIO REGION	Arnprior[a]	0.10	Midland[a]	0.37
	Barrie*	0.37	North Bay	0.28
	Belleville	0.27	Orillia	0.26
	Brantford*	0.36	Oshawa[a]	0.50
	Brockville	0.50	Owen Sound	0.05
	Chatham[e]	0.50	Pembroke[a]	0.20
	Cobourg[a]	0.30	Petawawa*	+
	Cornwall	0.50	Peterborough[a]	0.30
	Guelph[a]	1.33	Sarnia[a]	0.33
	Haileybury[a]	0.00	Sault Ste. Marie*	0.20
	Hawkesbury[a]	0.73	Simcoe[c]	0.06
	Kapuskasing	0.11	Smiths Falls[a]	0.40
	Kenora[a]	0.10	Stratford	0.23
	Kingston[a]	0.40	Timmins[b]	0.38
	Kirkland Lake	0.52	Trenton[a]	0.40
	Leamington	0.15	Wallaceburg	0.12
	Lincoln	+	Woodstock	0.20
	Lindsay	0.05		
PRAIRIES REGION	Brandon	0.29	Portage la Prairie	0.18
	Flin Flon*	0.19	Prince Albert	0.79
	Grande Prairie[d]	0.32	Red Deer[c]	0.07
	Lethbridge	0.12	Swift Current	0.09
	Medicine Hat*	0.13	Thompson	0.22
	Moose Jaw	0.28	Yorkton	0.15
	North Battleford*	0.40		
BRITISH COLUMBIA REGION	Chilliwack*	0.47	Port Alberni[a]	0.23
	Courtenay[a]	0.43	Powell River	0.27
	Cranbrook	0.39	Prince George[b]	0.87
	Dawson Creek	0.42	Prince Rupert[a]	0.47
	Kamloops[b]	0.53	Terrace[a]	0.03
	Kelowna[b]	0.42	Trail[a]	0.17
	Kitimat	0.08	Vernon	0.83
	Nanaimo[ac]	0.51	Williams Lake*	+
	Penticton	0.47		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipal jurisdictions within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the new, enlarged municipalities, as of 1973.
[c]Data available for 1973-74 only.
[d]Data available for 1974-75 only.
[e]Data available for 1973 and 1975 only.
SOURCE: Calculations based on Statistics Canada, Justice Statistics Division, Uniform Crime Reporting, Crime Statistics, unpublished tabulations for the years 1973-75. (Ottawa, received May 1977).

GRAPH 28. ROBBERIES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)
(Z Scores)

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SOREL
BRANDON
COWANSVILLE
MOOSE JAW
NORTH BAY
BELLEVILLE
LACHUTE
POWELL RIVER
ORILLIA
PORT ALBERNI
STRATFORD
THOMPSON
VICTORIAVILLE
PEMBROKE
SAULT STE. MARIE
WOODSTOCK
FLIN FLON
SAINT-GEORGES
EDMUNDSTON
PORTAGE LA PRAIRE
RIMOUSKI
SYDNEY
TRAIL
OROMOCTO
LEAMINGTON
YORKTON
MATANE
LA TUQUE
MEDICINE HAT
RIVIÈRE-DU-LOUP
SUMMERSIDE
SYDNEY MINES
TRURO
CHARLOTTETOWN
LETHBRIDGE
WALLACEBURG
KAPUSKASING
MONTMAGNY
ARNPRIOR
BATHURST
LABRADOR CITY
KENORA
SWIFT CURRENT
KITIMAT
RED DEER
GASPÉ
SIMCOE
ASBESTOS
LINDSAY
OWEN SOUND
DOLBEAU
TERRACE
CORNER BROOK
HAILEYBURY
KENTVILLE

ASPECT MEASURED	Though less frightening than crimes of violence, property crimes are much more likely to strike urban Canadians directly. Unlike violent crime, crimes against property are crimes of stealth, done secretly in the victim's absence without the use of force or threat of force. In order to ensure a consistently high level of reporting, only the most serious offences against property are included in the index. These comprise breaking and entering, theft over $200 and theft of motor vehicles. The incidence of serious property crimes has risen dramatically in the recent past. From 1973-75, the increase in the offence rates for serious property crime far exceeded the increases for violent crime on a nationwide basis. During this three-year time span, serious crime against property in Canada soared from 15.07 to 19.58 offences per 1000 population — a jump of 29.9 per cent.	In technical terms, it should be noted that reporting practices differ between violent crime and property crime. In contrast to crimes committed against the person, an offence is reported for each distinct or separate act undertaken in the commission of a property crime. Calculation of the summary measure, serious property crime, involves the addition of offences recorded in each offence category for the three-year period, with subsequent division by three to obtain the annual average. Rates per 1000 persons were then derived. All the difficulties of interpretation cited regarding the incidence of violent crime also apply to rates of serious property crime.
URBAN PATTERN	On a nationwide basis, the rate of serious property crimes per 1000 population increases progressively from east to west. Offences known to police greatly exceed the national average in B.C. communities, remain above average in Prairie cities and rest at the national norm in Ontario centres. Compared to the national average, relatively few incidents of serious crime against property were recorded in Québec centres, and fewer still in Maritime communities. Within regions, variation between centres in the level of illicit activity reported to police was greatest for cities located in Québec and B.C., and least for urban areas situated in the Atlantic provinces.	There is some evidence to suggest that the incidence of serious property crime in a community co-varies with its degree of population instability, its extent of commercial expansion and the level of wealth enjoyed by its residents. The rate of property crimes committed and recorded in medium-sized centres is strongly associated with the rate of population growth experienced, thereby suggesting that the arrival of newcomers, particularly of transients lured by the prospects of economic opportunity, provides a seedbed for increased criminal activity. Other correlates of a rapidly expanding population, including a less evolved neighbourhood social structure, few informal community institutions and loose, less developed social ties, also provide the atmosphere for a high level of crime against property. Apparently the opportunity provided by the economic expansion of a community have not been overlooked by those bent on criminal activity for the rate of serious property crime committed in medium-sized centres exhibits a strong, positive association with the index of commercial well-being and value of permits issued per 1000 population.

Finally, it can be noted that communities whose citizens have comparatively high average incomes also generally suffer from above average rates of serious property crime.

In contrast, many aspects of the socio-demographic profiles of medium-sized cities are, at the aggregate level, unrelated to the incidence of recorded property crime. Measures of population size, age structure and unemployment show no significant relationship to level of property crime committed in the communities studied. In like manner, proximity to the nearest metropolitan areas is unrelated to the incidence of property crime. Hence, the urban pattern uncovered is complex. Further knowledge of the underpinnings of property crime in Canadian urban centres can only be gained through detailed analysis of the geographic pattern of criminal activity and the socio-demographic profiles of cities.

a) Overall aggregate values	Serious property crimes per 1000 population		
Mean ($\bar{X}$)	15.3		
Standard deviation (S)	7.4		
Maximum	38.7		
Minimum	0.2		
b) By region	$\bar{X}$	S	N
Atlantic	9.8	3.8	16
Québec	12.7	6.2	30
Ontario	14.9	4.4	33
Prairies	16.0	5.6	13
British Columbia	26.2	7.7	16

OTHER MEASURES

Many kinds of measures are required to obtain a full understanding of the nature of crime and of the effectiveness of the criminal justice process. Some of the possible measures include (1) reported crime aggregated to produce the most reliable picture, (2) crime rates acording to the age-sex characteristics of the population, (3) juvenile crime, (4) the effectiveness of the police force, and (5) the functioning of the courts and correctional institutions. Unfortunately, the presentation of information for most of these measures is either not feasible, since data are not readily available at the city specific scale, or serves no useful purpose, since the available data suffer from conceptual weaknesses or definitional inconsistencies.

The use of indicators that report the rates of specific crimes, such as the incidence of robberies, effectively avoids the problems of aggregating criminal actions of differing degrees of severity into a criminal code index. But, although the use of crime specific measures circumvents the weighting issue, the applicability of these statistics as indicators of the general extent of criminality in a community is questionable.

It is well known that certain socio-demographic groups exhibit a greater propensity to commit crime than the general population as a whole. Hence, more comparable measures of the extent of criminal activity may be achieved if crime rates for communities are standardized according to the age-sex composition of the population.

As correction and rehabilitation programs should prove most beneficial when oriented to young offenders in order to dissuade them from embarking on a "life of crime", knowledge of the extent of juvenile delinquency in a community takes on increased importance. Unfortunately, the measure "Juveniles Charged" suffers from several inconsistencies. These inconsistencies arise from (1) the tendency to charge juveniles less frequently than adults, (2) the considerable discretion vested in police regarding the charging of juveniles, and (3) the use of different age limits from province to province in defining a juvenile.

The clearance rate for offences has traditionally been construed as an indicator of police effectiveness. However, interpretation proves difficult as clearance rates can vary according to the ratio of property to personal crimes in a community. Property crimes generally have low clearance rates since no offender is usually evident and there are generally no witnesses to the crime.

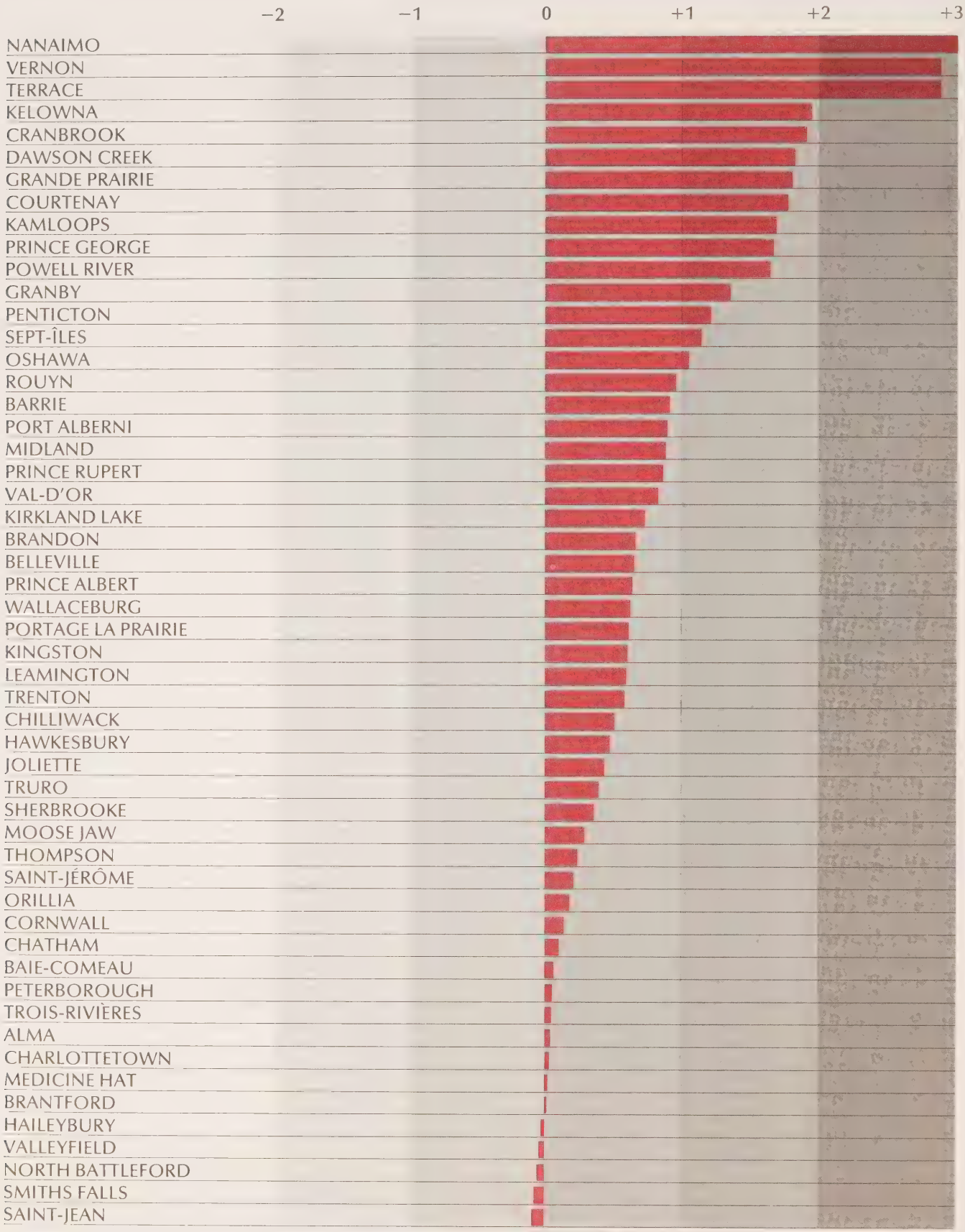
Consideration of court actions through the provision of indicators concerning the conviction and disposition of individuals charged with serious offences is a further possibility. Information regarding the incarceration and rehabilitation of convicted offenders is also necessary. However, such data are generally available on a region-wide rather than a city-specific basis.

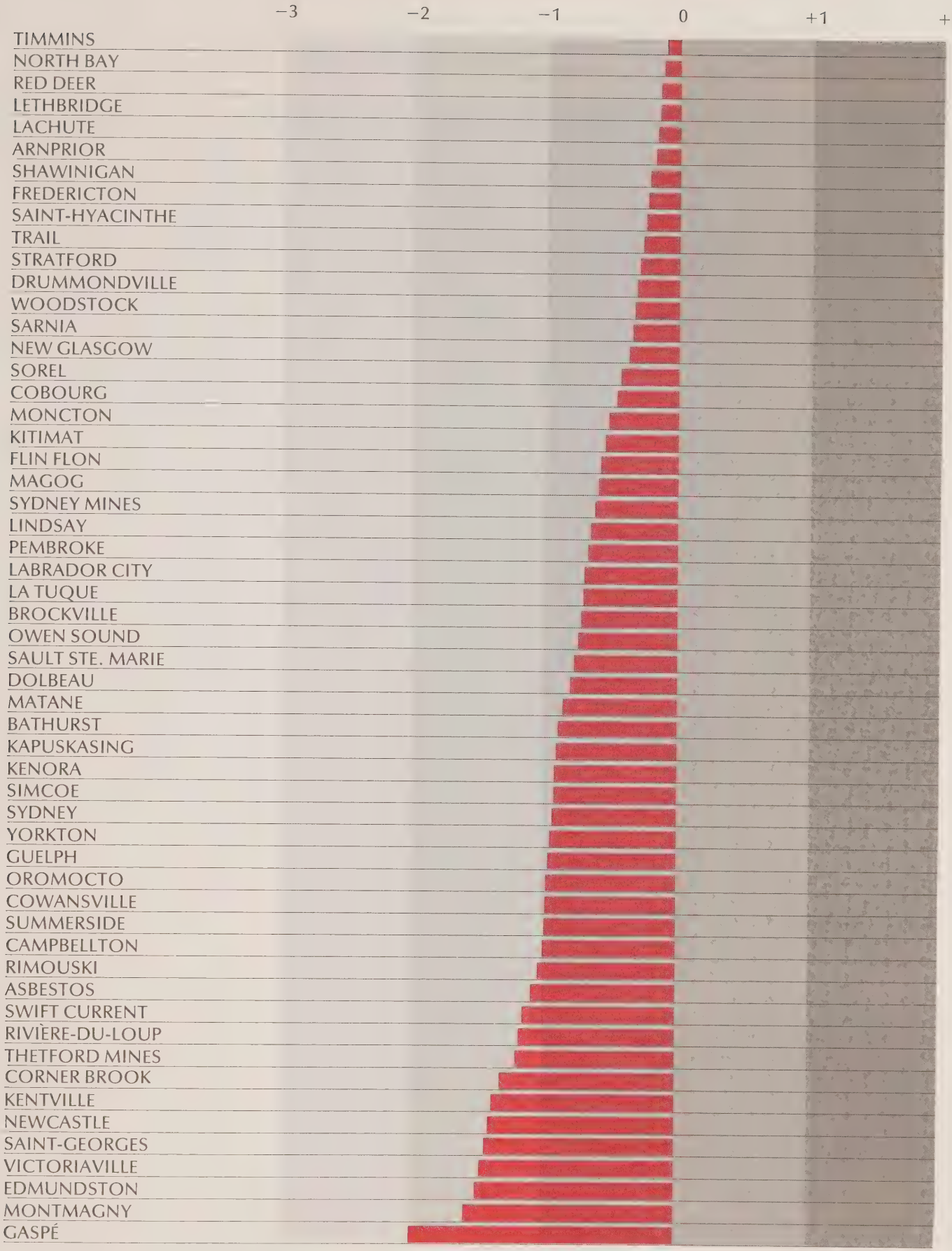
TABLE 31. SERIOUS PROPERTY CRIMES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)

ATLANTIC REGION	Bathurst	9.10	Moncton[b]	11.32
	Campbellton[a]	8.13	Newcastle[a]	5.53
	Charlottetown*	16.08	New Glasgow[a]	12.33
	Corner Brook	5.80	Oromocto	8.27
	Edmundston	4.53	Summerside[a]	8.20
	Fredericton[b]	13.36	Sydney[a]	8.97
	Grand Falls*	+	Sydney Mines[a]	10.80
	Kentville[a]	5.67	Truro[a]	18.13
	Labrador City[a]	10.17		
QUÉBEC REGION	Alma	16.25	Rivière-du-Loup	6.40
	Asbestos[a]	7.21	Rouyn*	22.42
	Baie-Comeau[a]	16.39	Saint-George*	5.28
	Cowansville	8.23	Saint-Hyacinthe[a]	13.30
	Dolbeau*	9.77	Saint-Jean[a]	14.60
	Drummondville[a]	12.73	Saint-Jérôme[a]	17.07
	Gaspé[c]	0.18	Sept-Îles	23.68
	Granby[a]	25.47	Shawinigan*	13.42
	Joliette[a]	18.57	Sherbrooke[a]	18.13
	Lachute*	13.60	Sorel[a]	11.63
	La Tuque	10.14	Thetford Mines[a]	6.33
	Magog[a]	11.13	Trois-Rivières[a]	16.27
	Matane	9.36	Val-d'Or[a]	21.53
	Montmagny	4.13	Valleyfield[a]	15.13
	Rimouski[a]	7.80	Victoriaville*	5.13
ONTARIO REGION	Arnprior[a]	13.57	Midland[a]	21.40
	Barrie*	21.88	North Bay	13.91
	Belleville	19.98	Orillia	16.81
	Brantford*	15.71	Oshawa[a]	23.13
	Brockville	9.94	Owen Sound	9.89
	Chatham[e]	16.52	Pembroke[a]	10.47
	Cobourg[a]	11.60	Petawawa*	+
	Cornwall	16.65	Peterborough[a]	16.37
	Guelph[a]	8.50	Sarnia[a]	12.37
	Haileybury[a]	15.20	Sault Ste. Marie*	9.86
	Hawkesbury[a]	18.57	Simcoe[c]	9.01
	Kapuskasing	9.03	Smiths Falls[a]	14.83
	Kenora[a]	9.03	Stratford	12.85
	Kingston[a]	19.23	Timmins[b]	14.55
	Kirkland Lake	20.54	Trenton[a]	19.17
	Leamington	19.20	Wallaceburg	19.55
	Lincoln	+	Woodstock	12.39
	Lindsay	10.77		
PRAIRIES REGION	Brandon	20.15	Portage la Prairie	19.38
	Flin Flon*	11.17	Prince Albert	19.58
	Grande Prairie[d]	28.36	Red Deer[c]	13.85
	Lethbridge	13.76	Swift Current	6.50
	Medicine Hat*	15.83	Thompson	17.14
	Moose Jaw	17.41	Yorkton	8.84
	North Battleford*	15.07		
BRITISH COLUMBIA REGION	Chilliwack*	18.90	Port Alberni[a]	21.43
	Courtenay[a]	28.27	Powell River	27.24
	Cranbrook	28.98	Prince George[b]	27.61
	Dawson Creek	28.38	Prince Rupert[a]	21.17
	Kamloops[b]	27.63	Terrace[a]	36.43
	Kelowna[b]	29.09	Trail[a]	13.07
	Kitimat	11.29	Vernon	36.50
	Nanaimo[ac]	38.83	Williams Lake*	+
	Penticton	24.30		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipal jurisdictions within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the new, enlarged municipalities, as of 1978.
[c]Data available for 1973-74 only.
[d]Data available for 1974-75 only.
[e]Data available for 1973 and 1975 only.
SOURCE: Calculations based on Statistics Canada, Justice Statistics Division, Uniform Crime Reporting, Crime Statistics, unpublished tabulations for the years 1973-75. (Ottawa, received May 1977).

GRAPH 29. SERIOUS PROPERTY CRIMES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)
(Z Scores)




−3
−2
−1
0
+1
+2
TIMMINS
NORTH BAY
RED DEER
LETHBRIDGE
LACHUTE
ARNPRIOR
SHAWINIGAN
FREDERICTON
SAINT-HYACINTHE
TRAIL
STRATFORD
DRUMMONDVILLE
WOODSTOCK
SARNIA
NEW GLASGOW
SOREL
COBOURG
MONCTON
KITIMAT
FLIN FLON
MAGOG
SYDNEY MINES
LINDSAY
PEMBROKE
LABRADOR CITY
LA TUQUE
BROCKVILLE
OWEN SOUND
SAULT STE. MARIE
DOLBEAU
MATANE
BATHURST
KAPUSKASING
KENORA
SIMCOE
SYDNEY
YORKTON
GUELPH
OROMOCTO
COWANSVILLE
SUMMERSIDE
CAMPBELLTON
RIMOUSKI
ASBESTOS
SWIFT CURRENT
RIVIÈRE-DU-LOUP
THETFORD MINES
CORNER BROOK
KENTVILLE
NEWCASTLE
SAINT-GEORGES
VICTORIAVILLE
EDMUNDSTON
MONTMAGNY
GASPÉ

Although the seriousness of risks inherent in operating a motor vehicle does not have the same impact on the public consciousness as do the perils posed by criminal activity, traffic-related mishaps represent a more immediate threat to life, limb and property for the average citizen than does crime. In fact, the number of deaths and injuries resulting from traffic accidents is far greater than those resulting from all criminal offences combined. Despite intensive efforts on the part of public authorities to promote traffic safety, the incidence of accidents rose 32.1 per cent in Canada from 1971-75, attaining a high of 33.1 accidents per 1000 population by 1975.[26]

Accidents, especially traffic accidents, are the number-one health problem among young adult Canadians. Automobile collisions are the most significant cause of death in our society, accounting for an increasingly larger proportion of potential years of life lost during the 1970s.[27] In addition, traffic accidents are a major contributor to the number of days spent in hospital in Canada. Further, traffic accidents extract a heavy toll among the young. On a nationwide basis, 50 per cent of all persons involved in non-fatal motor vehicle accidents are aged 5-24 years.

The monetary and human cost of motor vehicle accidents is staggering. Days of work lost, income foregone, compensation paid, property damage and vehicle repair costs are some of the economic ramifications. The human consequences of traffic accidents, including suffering, physical handicaps and psychological distress, are virtually incalculable. Motor vehicle safety is, therefore, a key component of the urban quality of life, and the means for monitoring and reducing motor vehicle hazards is an essential urban service.

Traffic safety is a high profile issue at all government levels. From imposition of motor vehicle safety standards at the federal level to consideration of lower speed limits and no-fault automobile insurance by the provinces, to the creation of neighbourhood traffic plans and implementation of school safety programs by municipal councils, traffic safety is a major concern of government. Although the linkage is sometimes overlooked, urban land-use planning has a fundamental influence on traffic safety. The juxtaposition of land uses permitted, particularly the location of uses that generate heavy traffic flows (i.e., shopping plazas, industry, apartment complexes) can strongly affect the number and length of trips that individuals take, the degree of traffic congestion incurred and, hence, the potential for accidents. Clearly, traffic safety is a goal which must be accorded due significance.

Given the pervasiveness of the automobile in everyday urban life and the multifold services and institutions involved in regulating traffic and coping with collisions, three quality of life measures are presented concerning the risks associated with automobile travel. The traffic hazards faced by urban residents are reflected in the rate of motor vehicle accidents recorded in a community and in the number of injuries incurred. In addition, the level of dangerous incidents and the strictness with which motorists are regulated are indicated by the measure on traffic violations.

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[26]Statistics Canada, *Crime and Traffic Enforcement Statistics, 1975,* Cat. 85-205 (Ottawa: 1977), pp. 1-4.

[27]Statistics Canada, *Perspective Canada* II (Ottawa: 1978).

TECHNICAL NOTES

The measures presented are derived from unpublished tabulations obtained from the Judicial Division, Statistics Canada. The information is collected through the Uniform Crime Reporting System, initiated in 1962 and revised in 1974 and 1977 by Statistics Canada in cooperation with the Canadian Association of Chiefs of Police. Under this system, police departments send monthly traffic statistics returns in a standardized format (form T) to Statistics Canada.

Not all traffic incidents that municipal police departments are requested to tabulate for Statistics Canada are summarized in this set of indicators. Injuries resulting from traffic accidents and dangerous driving charges were selected on the basis of their relatively high frequency of occurrence, which should provide reasonably consistent trends in smaller urban places. Relatively rare but more serious events or violations such as traffic fatalities or charges of criminal negligence are subject to random fluctuations in small communities and, thus, do not reliably depict the level or trend with respect to the traffic hazards experienced in a community.

Detailed calculation of the traffic indices involves a number of specific considerations of temporal and geographic coverage. Traffic statistics are available on an annual basis. In order to reduce the variance in the rates of injuries and violations experienced, particularly for relatively rare events in smaller communities, a three-year average (1973-75) was adopted. A longer time period was avoided as it would have tended to increase the problem of definitional changes and, thus, reduce comparability.

Problems of geographic coverage must also be noted. Correspondence between police jurisdictions by which the data are collected and the boundaries of the census agglomerations is not precise. In CAs where data were unavailable for some component parts, the population base was adjusted accordingly during calculation of injury and violation rates per 1000 population. The total inventory of recorded incidents in each city is, nevertheless, underreported. Traffic mishaps dealt with by the RCMP, or by the provincial police departments in Ontaio and Québec, are not included because the regional districts policed by these units do not coincide with community boundaries. Municipal boundary changes during the 1973-75 period posed further difficulties, as did the amalgamation and merger of local police forces.

ASPECT MEASURED	Injuries resulting from motor vehicle collisions represent a major health problem in Canada, particularly among young adults. The incidence of injuries is significant and the consequences considerable. Days off work, lost income, suffering, physical handicaps and mental distress are some of the economic and human consequences of traffic accidents for the injured. The costs to society of facilities and services in aid of traffic victims, including health care, emergency services and insurance adjustments, are high. However, some solace may be sought in recent trends. Despite the overall rise in traffic accident rates in Canada from 1973-75, the incidence of serious accidents involving injury or death actually declined over the three-year period. Though the figures are not a cause for relief or complacency, non-fatal accidents involving injury decreased moderately from 6.78 to 6.49 occurrences per 1000 population over the three-year time span, while the rate of fatal accidents declined slightly from 0.24 to 0.23 incidents per 1000 persons during the 1973-75 period. In technical terms, it should be noted that each injury incurred in a multiple-injury accident is included in the rates. The number of persons injured, rather than the number of accidents with injuries, is reflected by the measure. Calculation of the incidence of injuries for the three-year period involves summation of the yearly totals with subsequent division by three to obtain the annual average. Rates per 1000 persons were then derived.
DIFFICULTIES OF INTERPRETATION	The expression of rates of traffic injuries in terms of the general community population size must be viewed as relatively crude since rates of accidents, and thus injuries, are known to vary considerably by socio-demographic group (i.e., age, sex, marital status). The problem of ecological fallacy, the inputing of aggregate trends to individuals must also be noted.	The measure reflects the overall level of traffic injuries in a community rather than indicating the probability of an individual resident experiencing injury or property loss from involvement in a traffic accident. Clearly, the probability of individual drivers suffering injuries in an automobile collision depends on a host of other factors, including the miles driven per year, the condition of their motor vehicles, their driving experience, ability and safety habits and their visual acuity and reaction time.

URBAN PATTERN

Regional rates of motor vehicle injuries show moderate variation in Québec, Ontario, the Prairies and British Columbia. Mean rates for these regions range from 6.2 injuries per 1000 population in British Columbia to 7.8 per 1000 in Ontario. Québec and Prairie centres fall in between these scores with mean injury rates of 6.8 and 7.2, respectively. The mean rate for Atlantic centres stands out in comparison to the rates for other regions. Atlantic centres average only 3.5 injuries per 1000 population.

A number of factors may be related both to the relatively low injury rate in Atlantic centres and the variation in rates between individual communities. The level of automobile ownership, the extensiveness of the road network, the proximity of the community to major regional generators of traffic (i.e., large metropolitan areas and accompanying congested, high-speed freeways), the centres' demographic structure, the safety of the road network and climatic conditions are all factors which are likely to affect injury rates.

Lower rates of motor vehicle ownership mean fewer automobiles on the road and, thus, a reduced potential for accidents causing injury. Also, limited road networks may reduce vehicle use, thus lowering levels of serious accidents (e.g., Labrador City, Thompson). On the other hand, centres close to large metropolitan areas or major travel routes are likely to have disproportionate traffic flows and, thus, a greater probability of high rates of accidents and injuries. In support of this hypothesis it can be noted that Belleville, Oshawa, Woodstock and Chatham, all near highway 401, Barrie, on highway 400, and Saint-Jérôme, adjacent to the Laurentian Auto Route, all have high injury rates.

Demographic structure may also be an important factor affecting injury rates. Centres with a high concentration of young, single males aged 18-24 may have higher injury rates in that this demographic group is more likely than others to be involved in accidents.

The above factors interact with one another and with other localized factors such as safety of the roads, driver attitudes and weather conditions in affecting a centre's injury rates. Because of the large number of salient factors and their tendency to vary significantly from place to place, it is not surprising that no clear national pattern is discernable.

a) Overall aggregate values	Injuries per 1000 population 1973-1975		
Mean ($\bar{X}$)	6.6		
Standard deviation (S)	3.0		
Maximum	15.4		
Minimum	0.3		
b) By region	$\bar{X}$	S	N
Atlantic	3.5	2.1	15
Québec	6.8	3.3	30
Ontario	7.8	2.3	32
Prairies	7.2	3.7	13
British Columbia	6.2	1.5	16

OTHER MEASURES

Rather than focussing on the numerical incidence of traffic injuries or accidents, a measure of the seriousness of injuries and accidents could prove worthwhile. Total dollar damage, including cost of personal and family disruptions and medical costs, recommends itself as a useful indicator. To some extent, surrogates of dollar losses could be developed from the comparative rates and value of claims for automobile insurance.

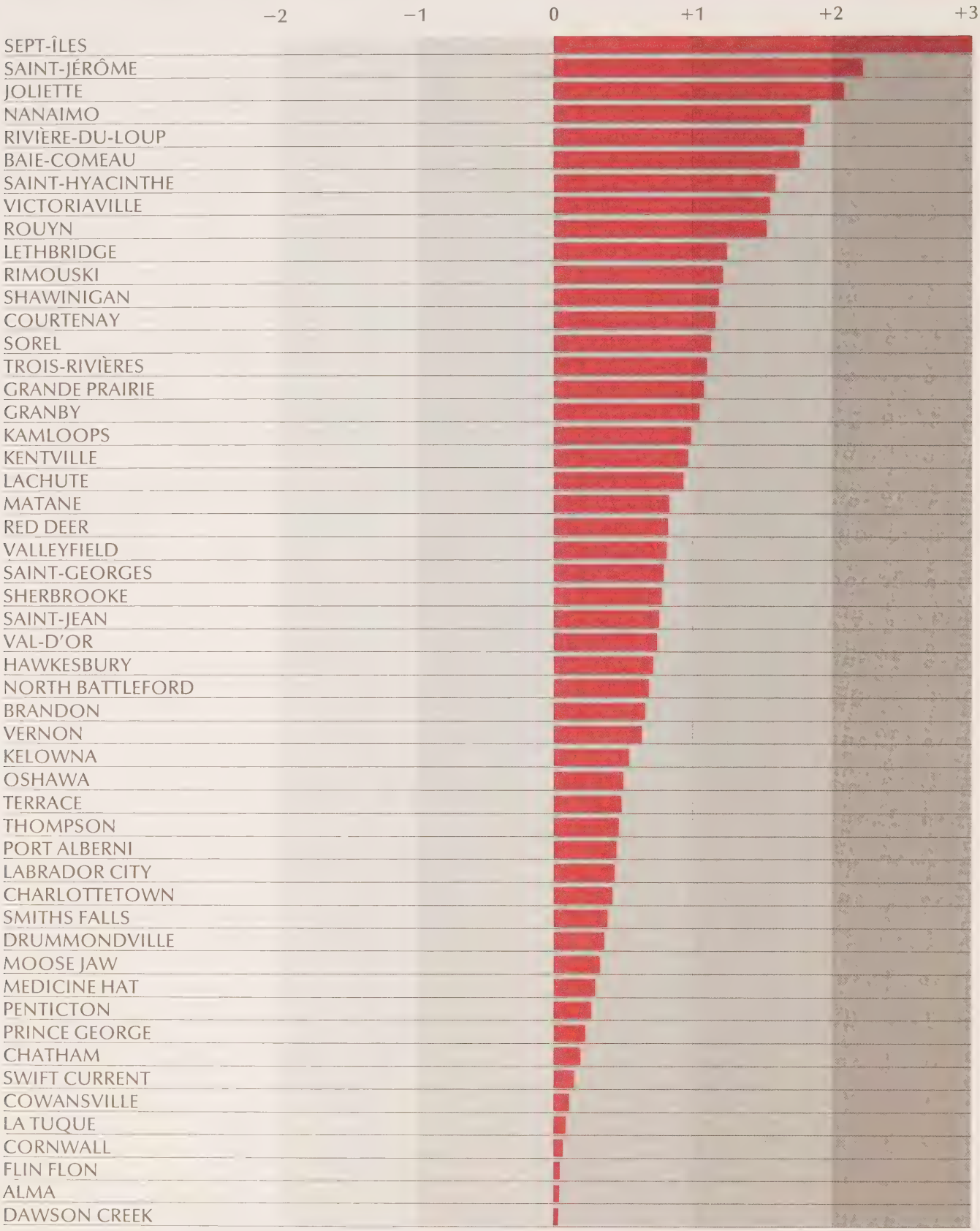
More serious and specific measures of traffic hazards incude traffic fatalities, as well as pedestrians and cyclists killed or injured.

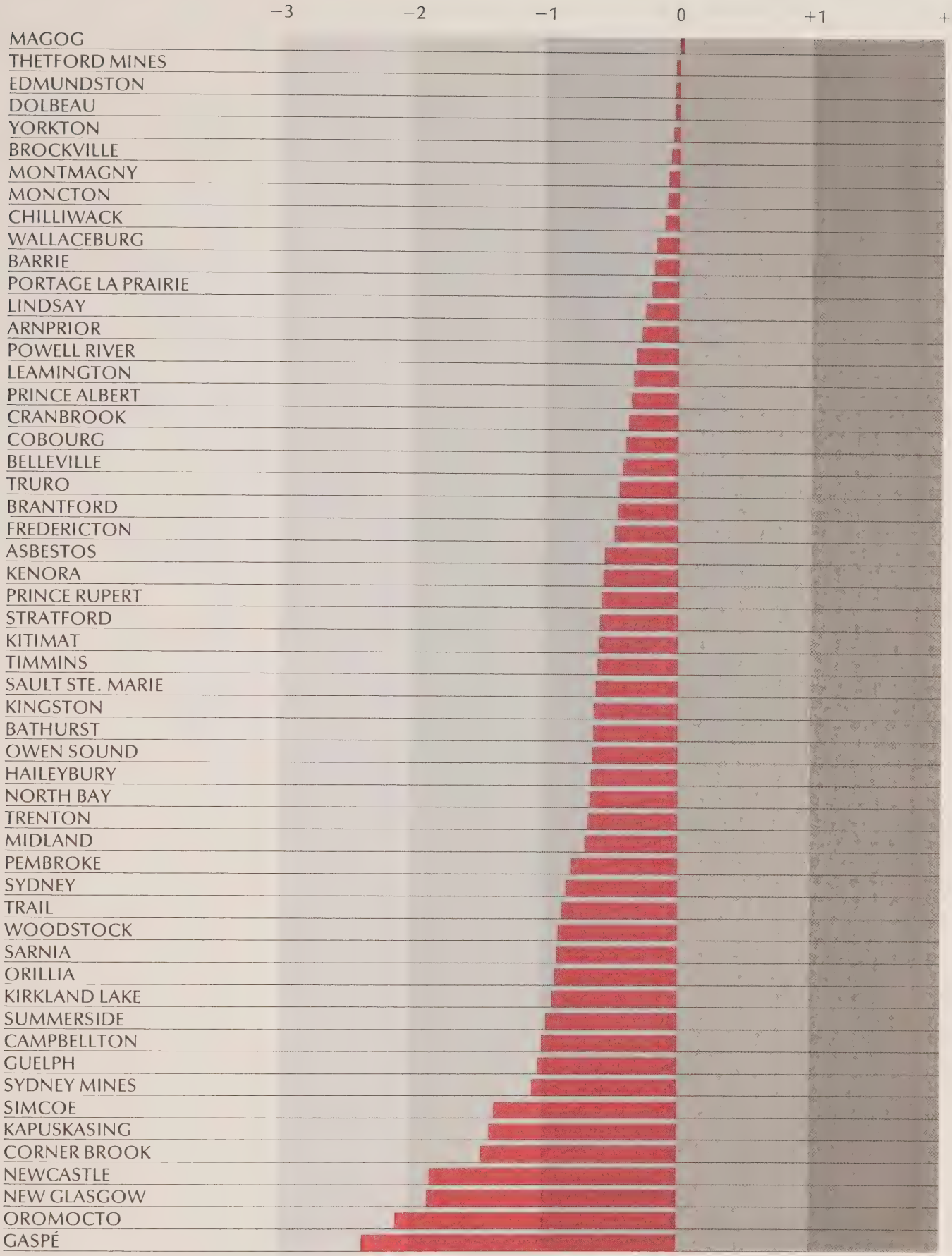
TABLE 32. PERSONS INJURED IN MOTOR VEHICLE ACCIDENTS PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)

ATLANTIC REGION	Bathurst	3.28	Moncton[b]	6.98
	Campbellton[a]	4.55	Newcastle[a]	1.05
	Charlottetown[a]	3.96	New Glasgow[a]	1.04
	Corner Brook	2.30	Oromocto	1.80
	Edmundston	6.25	Summerside[a]	2.40
	Fredericton[b]	7.07	Sydney[a]	3.41
	Grand Falls*	+	Sydney Mines[a]	2.42
	Kentville*	+	Truro[a]	3.52
	Labrador City[a]	1.80		
QUÉBEC REGION	Alma	9.21	Rivière-du-Loup	9.13
	Asbestos[a]	3.42	Rouyn*	6.58
	Baie-Comeau*	7.86	Saint-Georges*	2.43
	Cowansville	6.41	Saint-Hyacinthe[a]	6.66
	Dolbeau*	3.49	Saint-Jean*	7.87
	Drummondville[a]	10.54	Saint-Jérôme[a]	9.19
	Gaspé[c]	0.28	Sept-Îles	15.42
	Granby[a]	8.87	Shawinigan[a]	7.45
	Joliette[a]	11.16	Sherbrooke[a]	1.80
	Lachute*	8.74	Sorel[a]	7.11
	La Tuque[c]	6.44	Thetford Mines[a]	1.90
	Magog[a]	6.62	Trois-Rivières[a]	5.09
	Matane	5.94	Val-d'Or[a]	8.83
	Montmagny	6.93	Valleyfield[a]	8.81
	Rimouski[a]	5.45	Victoriaville*	9.39
ONTARIO REGION	Arnprior[a]	5.68	Midland[a]	8.56
	Barrie*	9.42	North Bay	9.56
	Belleville	9.18	Orillia	7.35
	Brantford*	7.00	Oshawa[a]	14.95
	Brockville	7.73	Owen Sound	5.69
	Chatham	11.59	Pembroke[a]	6.54
	Cobourg[a]	7.94	Petawawa*	+
	Cornwall	5.31	Peterborough*	+
	Guelph[a]	5.07	Sarnia[a]	6.88
	Haileybury[a]	5.38	Sault Ste. Marie*	10.43
	Hawkesbury[a]	4.84	Simcoe[c]	5.06
	Kapuskasing	4.58	Smiths Falls[a]	9.55
	Kenora[a]	8.53	Stratford	9.34
	Kingston[a]	8.03	Timmins[b]	7.80
	Kirkland Lake	6.01	Trenton[a]	8.78
	Leamington	6.72	Wallaceburg	7.80
	Lincoln	+	Woodstock	10.67
	Lindsay	7.68		
PRAIRIES REGION	Brandon	14.02	Portage la Prairie	4.56
	Flin Flon*	5.88	Prince Albert	5.77
	Grande Prairie[d]	1.83	Red Deer	5.51
	Lethbridge	13.96	Swift Current	7.30
	Medicine Hat*	5.95	Thompson	3.92
	Moose Jaw	7.79	Yorkton	5.95
	North Battleford*	10.81		
BRITISH COLUMBIA REGION	Chilliwack*	5.99	Port Alberni[a]	6.60
	Courtenay[a]	8.29	Powell River	5.23
	Cranbrook	4.68	Prince George[b]	5.64
	Dawson Creek	3.98	Prince Rupert[a]	5.12
	Kamloops[b]	6.78	Terrace[a]	5.25
	Kelowna[b]	8.96	Trail[a]	4.40
	Kitimat	5.72	Vernon	6.11
	Nanaimo[ac]	8.77	Williams Lake*	+
	Penticton	7.78		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipal jurisdictions within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the new, enlarged municipalities, as of 1973.
[c]Data available for 1973-74 only.
[d]Data available for 1974-75 only.
SOURCE: Calculations based on: Statistics Canada, Justice Statistics Division, Uniform Crime Reporting, Traffic Enforcement Statistics, unpublished tabulations for the years 1973-75 (Ottawa, received May 1977).

GRAPH 30. PERSONS INJURED IN MOTOR VEHICLE ACCIDENTS PER 1000 POPULATION: ANNUAL AVERAGE (1973-75) (Z Scores)

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MAGOG
THETFORD MINES
EDMUNDSTON
DOLBEAU
YORKTON
BROCKVILLE
MONTMAGNY
MONCTON
CHILLIWACK
WALLACEBURG
BARRIE
PORTAGE LA PRAIRIE
LINDSAY
ARNPRIOR
POWELL RIVER
LEAMINGTON
PRINCE ALBERT
CRANBROOK
COBOURG
BELLEVILLE
TRURO
BRANTFORD
FREDERICTON
ASBESTOS
KENORA
PRINCE RUPERT
STRATFORD
KITIMAT
TIMMINS
SAULT STE. MARIE
KINGSTON
BATHURST
OWEN SOUND
HAILEYBURY
NORTH BAY
TRENTON
MIDLAND
PEMBROKE
SYDNEY
TRAIL
WOODSTOCK
SARNIA
ORILLIA
KIRKLAND LAKE
SUMMERSIDE
CAMPBELLTON
GUELPH
SYDNEY MINES
SIMCOE
KAPUSKASING
CORNER BROOK
NEWCASTLE
NEW GLASGOW
OROMOCTO
GASPÉ

ASPECT MEASURED	Most traffic accidents are the result of driver error, usually involving a violation of traffic laws. Two of the most serious and widespread abuses of the law are dangerous driving and drunken driving. As witnessed by the substantial number of serious accidents in which impaired drivers are implicated, drunkenness behind the wheel poses a severe traffic hazard and, hence, a major threat to public safety and the quality of life.	More specifically, the offence of Dangerous Driving applies under the Criminal Code to "everyone who drives a motor vehicle on a (public roadway) in a manner that is dangerous to the public having regard to all the circumstances including the nature, condition and use of such (a roadway) and the amount of traffic . . . " (S. 233(4) C-C). The offence of impaired driving applies under the criminal code to "everyone who, while his ability is impaired by alcohol or a drug, drives a motor vehicle or has care or control of a motor vehicle" (S. 234 C-C). Computation involved summation of the offences: Dangerous Driving — Criminal Code; Dangerous Driving — Provincial Statute; Impaired Driving — Criminal Code, for the three-year period, followed by summation into one index with subsequent division by three to obtain the annual average. Rates per 1000 persons were then calculated.

DIFFICULTIES OF INTERPRETATION

The actual number of serious traffic offences known to police does not comprise the absolute inventory of persons involved in dangerous or impaired driving, but, rather, is a function of (1) the institutional response to traffic crime, and (2) the public reaction to traffic crime. Clearly, many incidents of dangerous or drunken driving go undetected. The level of detection is, in part, a function of the strength, training and efficiency of local law enforcement agencies and of the array of equipment at their disposal, including the number of patrol cars and breathalyzer machines. The number of charges laid in a community can also vary directly with the rigour of enforcement pursued by local authorities, which, in part, reflects the degree of political will and supportive public attitudes in the urban centres.

Also, as in the case of the other crime and traffic measures, due consideration must be given to problems of ecological fallacy as well as to the expression of violation rates in relation to the principal sociodemographic groups at risk, particularly young adults.

URBAN PATTERN

Regional rates of driving offences increase from east to west. Mean rates are lowest in the Atlantic and Québec regions where the respective rates are 6.5 offences per 1000 and 4.0 per 1000. Ontario is next in line, with 9.1 offences per 1000, followed by the Prairies, with a rate of 10.8, and British Columbia, where the incidence of offences is 15.9 per 1000.

Within all regions, save Québec, there is substantial variation among centres in offence rates. However, except for the tendency for new resource towns with large numbers of young single adults to have relatively higher rates (e.g., Labrador City, Sept-Îles, Thompson), there is no readily apparent patterning of variation.

There is a multitude of factors which may affect the commission and reporting of driving offences. Some of the more important of these factors are:

- the demographic composition of the population in the community and surrounding regions;
- local attitudes to alcohol, drinking habits and number of beverage rooms in the community;
- the efficiency of detection and rigour of law enforcement by the local police force, a factor which is, in part, a function of police manpower, the number of patrol cars and other equipment and enforcement practices.

Variations in any of these factors may result in significant change in a community's offence rate. As a consequence, it is not surprising that no clear national patterning of community offence rates is discernable.

a) Overall aggregate values	Driving offences per 1000 population		
Mean ($\bar{X}$)	8.1		
Standard deviation (S)	5.9		
Maximum	29.0		
Minimum	0.0		
b) By region	$\bar{X}$	S	N
Atlantic	6.5	5.4	16
Québec	4.0	2.4	30
Ontario	9.1	4.7	32
Prairies	10.8	4.9	13
British Columbia	15.9	4.8	16

OTHER MEASURES

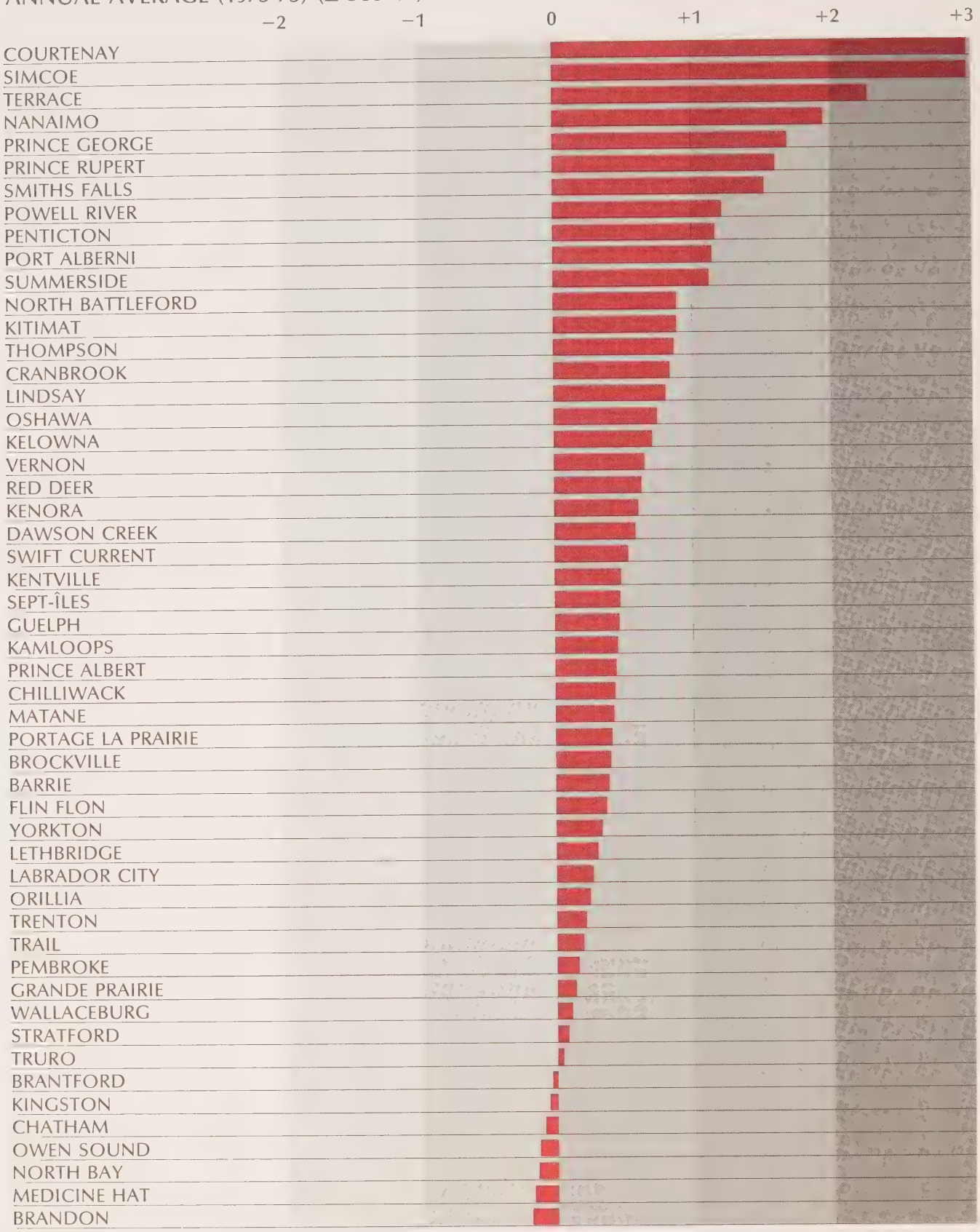
There is a full array of traffic offences whose incidence can be monitored. However, their use as indicators is hampered by difficulties such as (1) variations in definitions from one province to another for provincial statutes, or (2) a less serious offence which is more subject to discretionary enforcement (e.g., municipal bylaws and parking violations), or (3) a more serious offence for which the incidence is relatively infrequent in a small centre (e.g., criminal negligence).

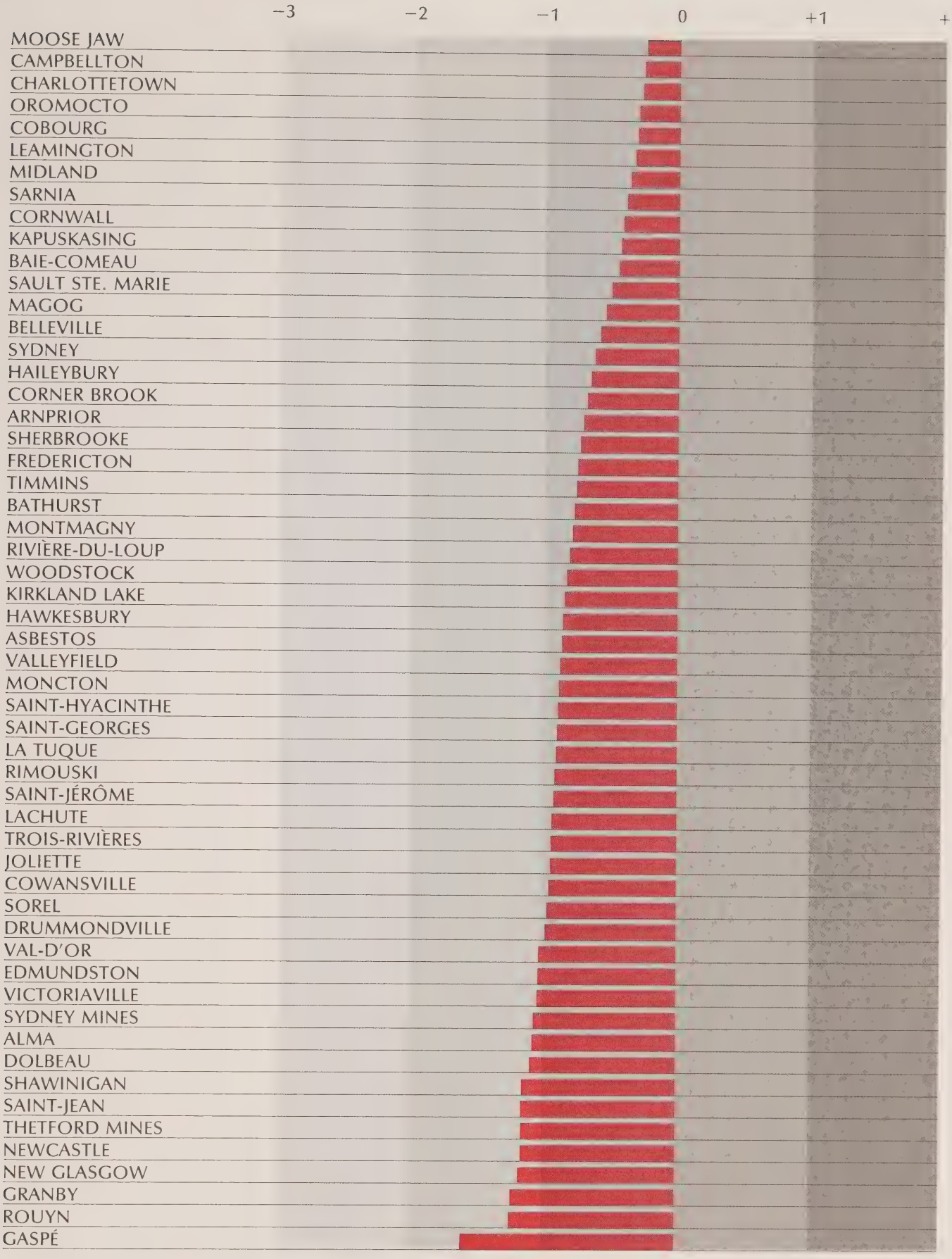
TABLE 33. DANGEROUS AND DRUNKEN DRIVING OFFENCES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75)

ATLANTIC REGION	Bathurst	4.73	Moncton[b]	4.06
	Campbellton[a]	7.72	Newcastle[a]	2.26
	Charlottetown[a]	7.45	New Glasgow[a]	2.23
	Corner Brook	5.42	Oromocto	7.27
	Edmundston	3.02	Summerside[a]	15.37
	Fredericton[b]	4.86	Sydney[a]	5.56
	Grand Falls*	+	Sydney Mines[a]	2.87
	Kentville*	11.84	Truro[a]	9.04
	Labrador City[a]	10.47		
QUÉBEC REGION	Alma	2.64	Rivière-du-Loup	4.58
	Asbestos[a]	4.24	Rouyn*	1.64
	Baie-Comeau*	5.93	Saint-Georges*	3.99
	Cowansville	3.30	Saint-Hyacinthe[a]	4.03
	Dolbeau*	2.51	Saint-Jean*	2.43
	Drummondville[a]	3.12	Saint-Jérôme[a]	3.62
	Gaspé[c]	0.00	Sept-Îles	11.79
	Granby[a]	1.67	Shawinigan[a]	2.46
	Joliette[a]	3.40	Sherbrooke[a]	5.24
	Lachute*	3.62	Sorel[a]	3.19
	La Tuque[c]	3.85	Thetford Mines[a]	2.38
	Magog[a]	5.80	Trois-Rivières[a]	3.54
	Matane	11.32	Val-d'Or[a]	3.05
	Montmagny	4.64	Valleyfield[a]	4.09
	Rimouski[a]	3.84	Victoriaville*	2.96
ONTARIO REGION	Arnprior[a]	5.36	Midland[a]	6.74
	Barrie*	10.82	North Bay	8.13
	Belleville	5.68	Orillia	10 43
	Brantford*	8.94	Oshawa[a]	13.32
	Brockville	10.90	Owen Sound	8.31
	Chatham	8.67	Pembroke[a]	9.89
	Cobourg[a]	7.21	Petawawa*	+
	Cornwall	6.33	Peterborough*	+
	Guelph[a]	11.65	Sarnia[a]	6.58
	Haileybury[a]	5.44	Sault Ste. Marie*	5.91
	Hawkesbury[a]	4.34	Simcoe[c]	28.48
	Kapuskasing	6.25	Smiths Falls[a]	17.73
	Kenora[a]	12.68	Stratford	9.04
	Kingston[a]	8.85	Timmins[b]	4.80
	Kirkland Lake	4.36	Trenton[a]	10.24
	Leamington	7.02	Wallaceburg	9.15
	Lincoln	+	Woodstock	4.53
	Lindsay	13.67		
PRAIRIES REGION	Brandon	7.88	Portage la Prairie	11.04
	Flin Flon*	10.82	Prince Albert	11.53
	Grande Prairie[d]	9.82	Red Deer	12.75
	Lethbridge	10.48	Swift Current	12.14
	Medicine Hat*	7.91	Thompson	13.92
	Moose Jaw	7.85	Yorkton	10.67
	North Battleford*	14.17		
BRITISH COLUMBIA REGION	Chilliwack*	11.42	Port Alberni[a]	15.40
	Courtenay[a]	29.03	Powell River	16.12
	Cranbrook	13.76	Prince George[b]	18.80
	Dawson Creek	12.67	Prince Rupert[a]	17.99
	Kamloops[b]	11.56	Terrace[a]	22.29
	Kelowna[b]	13.32	Trail[a]	10.06
	Kitimat	14.15	Vernon	12.81
	Nanaimo[ac]	20.14	Williams Lake*	+
	Penticton	15.57		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipal jurisdictions within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the new, enlarged municipalities, as of 1973.
[c]Data available for 1973-74 only.
[d]Data available for 1974-75 only.
SOURCE: Calculations based on: Statistics Canada, Justice Statistics Division, Uniform Crime Reporting, Traffic Enforcement Statistics, unpublished tabulation for the years 1973-75 (Ottawa, received May 1977).

GRAPH 31. DANGEROUS AND DRUNKEN DRIVING OFFENCES PER 1000 POPULATION: ANNUAL AVERAGE (1973-75) (Z Scores)




−3
−2
−1
0
+1
+2
MOOSE JAW
CAMPBELLTON
CHARLOTTETOWN
OROMOCTO
COBOURG
LEAMINGTON
MIDLAND
SARNIA
CORNWALL
KAPUSKASING
BAIE-COMEAU
SAULT STE. MARIE
MAGOG
BELLEVILLE
SYDNEY
HAILEYBURY
CORNER BROOK
ARNPRIOR
SHERBROOKE
FREDERICTON
TIMMINS
BATHURST
MONTMAGNY
RIVIÈRE-DU-LOUP
WOODSTOCK
KIRKLAND LAKE
HAWKESBURY
ASBESTOS
VALLEYFIELD
MONCTON
SAINT-HYACINTHE
SAINT-GEORGES
LA TUQUE
RIMOUSKI
SAINT-JÉRÔME
LACHUTE
TROIS-RIVIÈRES
JOLIETTE
COWANSVILLE
SOREL
DRUMMONDVILLE
VAL-D'OR
EDMUNDSTON
VICTORIAVILLE
SYDNEY MINES
ALMA
DOLBEAU
SHAWINIGAN
SAINT-JEAN
THETFORD MINES
NEWCASTLE
NEW GLASGOW
GRANBY
ROUYN
GASPÉ

LEVEL OF PROTECTIVE SERVICES: POLICE

POLICE MANPOWER (1974)

ASPECT MEASURED

In contrast to the two previous sections, which presented output measures of risk and safety, the focus here is on inputs. Specifically, the concern is with the inputs the community provides through its police department to protect its citizens from a variety of risks. Protective services provided via police extend beyond the apprehending of criminal offenders to include patrolling, regulation of traffic, safety checks and public education. Presumably, the higher the level of police manpower in a community, the greater will be the variety and quality of protective services provided; consequently, the greater the safety and security of citizens in the community.

Police manpower is defined as peace officers employed full-time for the preservation and maintenance of the public peace, and includes sworn-in policemen and policewomen. Cadets and other full-time employees of the police department are excluded. Use of the municipal population base pinpoints the population that is served, the population that, by and large, pays for the service and the population at risk. Police administration statistics are collected on an annual basis and are intended to represent conditions existing on 31 December of the given year.

With regard to geographic coverage, correspondence between police jursidictions, by which data are collected, and the boundaries of the census agglomerations is not precise. In census agglomerations where data were available for some component municipalities, the population base was adjusted accordingly during calculation of manpower per 1000 population.

The information is obtained from the Judicial Division, Statistics Canada. These data are collected through the Uniform Crime Reporting System, initiated in 1962 by Statistics Canada in cooperation with the Canadian Association of Chiefs of Police. Under this system, police departments annually forward administration statistics in a standardized format to Statistics Canada.

DIFFICULTIES OF INTERPRETATION	Although it is a simple and useful summary measure, police manpower only crudely represents the concept "level of protective service". Omitted from consideration are a host of factors that may affect the efficiency and effectiveness of police operations such as the levels of training and experience of the policemen, the array of equipment available, the departmental planning and administrative processes in effect and the extensiveness of the geographical area protected, as well as the configuration of the road network.	
URBAN PATTERN	Generally, police manpower levels decline from east to west. The Atlantic centres with an average of 1.6 police officers per 1000 have the highest level of police manpower, followed by Québec and Ontario where the average in both cases is 1.5 per 1000. Lowest levels of police manpower are found in the Prairies and British Columbia. In both regions, the average is 1.4 police officers per 1000 population. As can be seen from these figures, regional differences are not very large. Overall police manpower levels do not appear to be significantly associated with any of the other community characteristics considered in this study. For example, one might expect that manpower levels would co-vary with population size, growth rate or economic prosperity. However, no such co-variation is apparent. Similarly, police manpower is not related to the rate of crimes reported to police, or to the rate of traffic injuries.	The lack of association between police manpower and the other community characteristics under considerations here does not imply that no other community characteristics are associated with police manpower.In fact, it seems quite plausible that police manpower is related to such factors as the financial status of the community and the geographic area or miles of roadway which lie within the jurisdiction of the municipality. However, even if data were available on these community characteristics, it is quite likely that their association with police manpower levels would be relatively weak due to the differences in police administrative practices (e.g., the number of men required in a patrol car, the scope of functions performed by local police and the use of sophisticated equipment as a means of reducing the need for manpower).

a) Overall aggregate values	Police per 1000 population (1974)		
Mean ($\bar{X}$)	1.4		
Standard deviation (S)	0.3		
Maximum	2.3		
Minimum	0.2		
b) By region	$\bar{X}$	S	N
Atlantic	1.6	0.5	16
Québec	1.5	0.4	30
Ontario	1.5	0.2	31
Prairies	1.4	0.2	13
British Columbia	1.4	0.4	16

OTHER MEASURES

Measures of police service may be developed from several standpoints including budgetary expenditures allotted to the police force, equipment utilized by police and manpower levels. Two specific alternatives are Offences Reported per Police Officer and Police Vehicles per Miles of the Community Road Network.

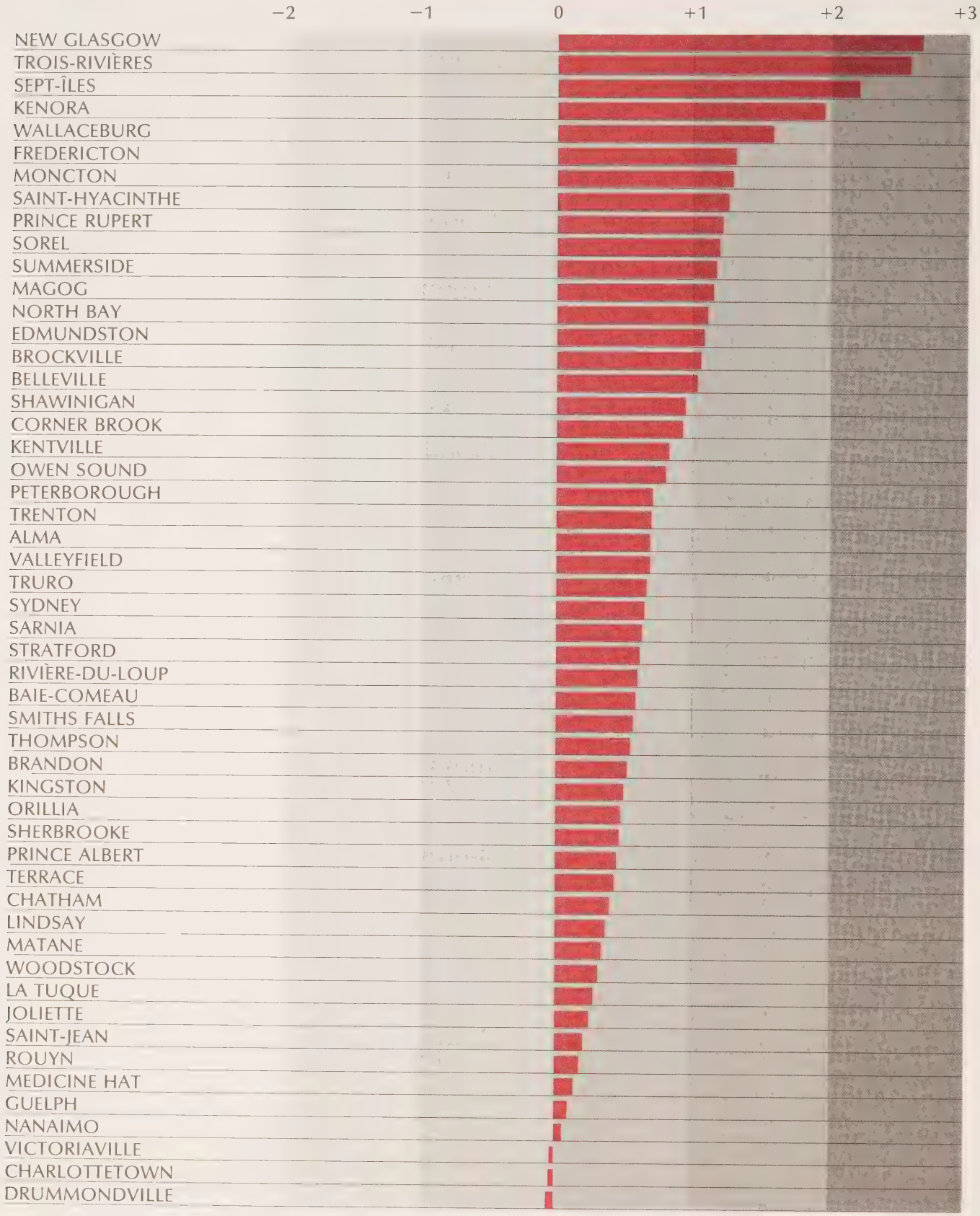
The former features the advantage of measuring the workload placed on police resources but overemphasizes the crime-solving aspect of police work, which has been estimated to account for only a small portion of all police time. The latter measures equipment which can contribute to, but does not determine, the level of protective service. In addition, the type and configuration of the road network cannot be taken into account. Both measures can be calculated from existing data collected by the Judicial Division, Statistics Canada.

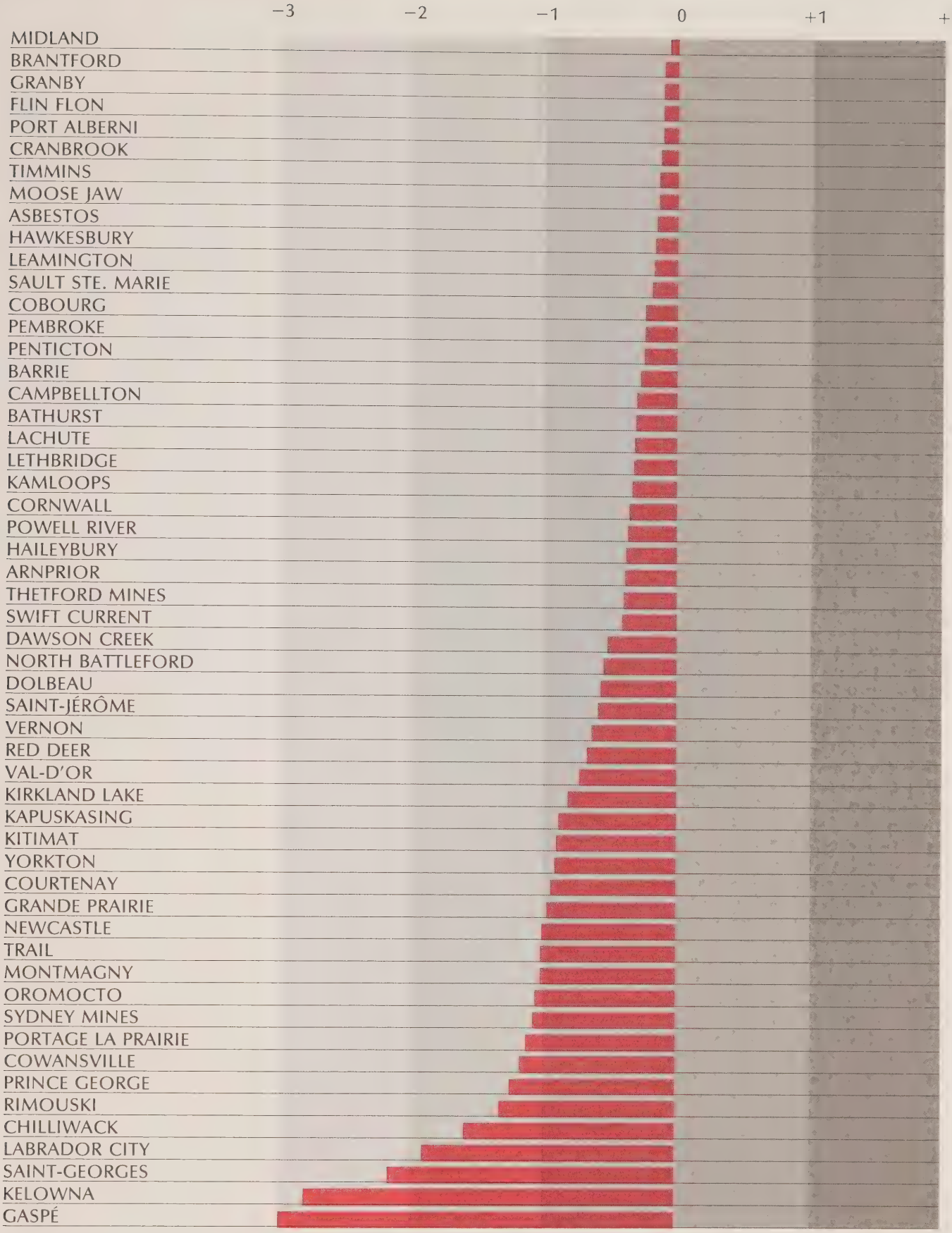
TABLE 34. POLICE MANPOWER PER 1000 POPULATION (1974)

ATLANTIC REGION	Bathurst	1.34	Moncton[b]	1.83
	Campbellton[a]	1.34	Newcastle[a]	1.14
	Charlottetown[a]	1.44	New Glasgow[a]	2.28
	Corner Brook	1.72	Oromocto	1.12
	Edmundston	1.77	Summerside[a]	1.80
	Fredericton[b]	1.84	Sydney[a]	1.63
	Grand Falls*	+	Sydney Mines[a]	1.12
	Kentville*	1.68	Truro[a]	1.64
	Labrador City[a]	0.85		
QUÉBEC REGION	Alma	1.65	Rivière-du-Loup	1.62
	Asbestos[a]	1.39	Rouyn*	1.50
	Baie-Comeau*	1.61	Saint-Georges*	0.76
	Cowansville	1.09	Saint-Hyacinthe[a]	1.83
	Dolbeau*	1.26	Saint-Jean*	1.51
	Drummondville[a]	1.43	Saint-Jérôme[a]	1.26
	Gaspé	0.18	Sept-Îles	2.11
	Granby[a]	1.41	Shawinigan[a]	1.72
	Joliette[a]	11.52	Sherbrooke[a]	1.57
	Lachute*	1.33	Sorel[a]	1.80
	La Tuque	1.52	Thetford Mines*	1.29
	Magog[a]	1.79	Trois-Rivières[a]	2.24
	Matane	1.55	Val-d'Or[a]	1.22
	Montmagny	1.13	Valleyfield[a]	1.65
	Rimouski[a]	1.05	Victoriaville*	1.44
ONTARIO REGION	Arnprior[a]	1.29	Midland[a]	1.42
	Barrie*	1.34	North Bay	1.78
	Belleville	1.76	Orillia	1.57
	Brantford*	1.41	Oshawa*	+
	Brockville	1.76	Owen Sound	1.68
	Chatham	1.56	Pembroke[a]	1.35
	Cobourg[a]	1.36	Petawawa*	+
	Cornwall	1.31	Peterborough[a]	1.65
	Guelph[a]	1.49	Sarnia[a]	1.63
	Haileybury[a]	1.30	Sault Ste. Marie*	1.37
	Hawkesbury[a]	1.38	Simcoe	+
	Kapuskasing	1.18	Smiths Falls[a]	1.61
	Kenora[a]	2.06	Stratford	1.63
	Kingston[a]	1.59	Timmins[b]	1.39
	Kirkland Lake	1.20	Trenton[a]	1.65
	Leamington	1.38	Wallaceburg	1.93
	Lincoln	+	Woodstock	1.54
	Lindsay	1.55		
PRAIRIES REGION	Brandon	1.59	Portage la Prairie	1.10
	Flin Flon*	1.41	Prince Albert	1.57
	Grande Prairie	1.15	Red Deer	1.22
	Lethbridge	1.33	Swift Current	1.29
	Medicine Hat*	1.49	Thompson	1.61
	Moose Jaw	1.39	Yorkton	1.16
	North Battleford*	1.26		
BRITISH COLUMBIA REGION	Chilliwack*	0.96	Port Alberni[a]	1.41
	Courtenay[a]	1.15	Powell River	1.31
	Cranbrook	1.40	Prince George[b]	1.08
	Dawson Creek	1.27	Prince Rupert[a]	1.82
	Kamloops[b]	1.32	Terrace[a]	1.57
	Kelowna[b]	0.52	Trail[a]	1.14
	Kitimat	1.18	Vernon	1.24
	Nanaimo[a]	1.45	Williams Lake*	+
	Penticton	1.35		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
[a]Data not available for some municipal jurisdictions within the census agglomeration. Information for the largest municipality is included.
[b]Data provided for the enlarged municipality as of 1973.
SOURCE: Calculations are based on Statistics Canada, *Police Administration Statistics, 1974* (Ottawa: Justice Statistics Division, 1977).

GRAPH 32. POLICE MANPOWER PER 1000 POPULATION (1974)
(Z Scores)

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+2
MIDLAND
BRANTFORD
GRANBY
FLIN FLON
PORT ALBERNI
CRANBROOK
TIMMINS
MOOSE JAW
ASBESTOS
HAWKESBURY
LEAMINGTON
SAULT STE. MARIE
COBOURG
PEMBROKE
PENTICTON
BARRIE
CAMPBELLTON
BATHURST
LACHUTE
LETHBRIDGE
KAMLOOPS
CORNWALL
POWELL RIVER
HAILEYBURY
ARNPRIOR
THETFORD MINES
SWIFT CURRENT
DAWSON CREEK
NORTH BATTLEFORD
DOLBEAU
SAINT-JÉRÔME
VERNON
RED DEER
VAL-D'OR
KIRKLAND LAKE
KAPUSKASING
KITIMAT
YORKTON
COURTENAY
GRANDE PRAIRIE
NEWCASTLE
TRAIL
MONTMAGNY
OROMOCTO
SYDNEY MINES
PORTAGE LA PRAIRIE
COWANSVILLE
PRINCE GEORGE
RIMOUSKI
CHILLIWACK
LABRADOR CITY
SAINT-GEORGES
KELOWNA
GASPÉ

LEVEL OF RISK: FIRE

AVERAGE ANNUAL FIRE LOSSES

ASPECT MEASURED

The risk to life and property from fires is extremely significant in Canadian cities. The pervasiveness of the danger is underlined by a few national statistics. In 1975, the nearly 70 000 fires reported in Canada resulted in 822 lives lost, $464 million in direct property damage and an estimated $2.1 billion in related costs arising from lost production and unemployment. The leading causes of fires were smokers' carelessness (19 per cent), electrical equipment (16 per cent) and heating equipment (11 per cent).

That the incidence of fire bears directly on the neightbourhood quality of life is reflected in the occurrence of the majority of fires (57 per cent in 1957) in residential areas. Older, less flame-resistant frame structures generally situated in the aging inner areas of urban places were the most susceptible to fire.

The specific measure, average annual fire losses per person, provides a crude indication of the threat posed to the residents of a community by fire. The measure presented was calculated from the *Annual Reports of the Dominion Fire Commissioner of Canada,* for the years 1966 to 1975. The report is compiled from data provided by the Association of Fire Marshalls and Fire Commissioners. In cases of missing data, direct reference was made to the Fire Marshall's report for the respective province in the given year.

Calculation of the measure involves the summation of fire losses (in dollars) for the ten-year period, 1966-1975, with subsequent division by ten to derive the yearly average. The dollar loss per capita is then computed by use of the 1971 census population, which roughly approximates the mid-point of the ten-year time span.

Detailed computation of the fire losses index requires consideration of the temporal and geographic coverage. Fire loss data are available on an annual basis. In order to provide reliable estimates and cross-sectional comparisons of the risk by fire incurred in a community, a long time span is needed. Thus, the ten-year average employed tends to smooth out the severe yearly fluctuations in fire losses that can occur when a community is hit by a major fire.

Problems of geographic coverage must also be noted. Correspondence between municipal jurisdictions by which the data are reported and the boundaries of the census is not precise. In census agglomerations where data were not available for some component municipalities, the population base was adjusted accordingly. Changes in municipal boundaries during the ten-year period due to annexations and amalgamations posed further difficulties.

DIFFICULTIES OF INTERPRETATION

Calculation of fire losses on a community-wide basis must be considered relatively crude since the incidence of fires in an urban area occurs disproportionately in aging buildings, often of frame construction, which are concentrated in the older downtown areas.

More technically, communities suffering heavy fire losses in recent years may feature a slightly higher average than communities which incurred serious fire losses in the earlier years of the ten-year period because the fire losses are not adjusted to the cost-of-living index. Also, the fire loss data obtained directly from the province of Québec had been subjected to a correction factor which compensated for the losses incurred in extreme fires. Hence, fire losses reported for Québec communities are, in some instances, slightly lower than they would have been otherwise.

URBAN PATTERN

The average fire loss for all non-metropolitan centres is $13.6 per person. Centres in Québec, Ontario and the Prairies have average fire losses below the national average, with respective scores of $11.3, $12.8 and $11.3 per person. On the other hand, average fire losses of $14.2 in the Atlantic region and $20.2 in British Columbia are above the national average.

In addition to experiencing higher average fire losses, centres in the Atlantic region and British Columbia vary more among themselves than do centres in the other regions. In comparison to the moderate variation found in Québec, Ontario and the Prairies, where respective standard deviations scores are 3.8, 5.4 and 5.8, the standard deviations of 10.3 in the Atlantic region and 17.8 in British Columbia are quite high.

Some of the more obvious factors that are likely to account for variations in community fire losses can be identified. First, proximity to extensive forest lands may increase the probability of high fire losses. For example, the high rate of loss in Williams Lake and in some of the other British Columbia centres may be related to this factor. Second, the presence of heavy industry using flammable substances may increase the potential for a major fire. Third, the widespread use of wood as a building material in the community may result in a greater likelihood of fires. Finally, variations in the quality of firefighting equipment and manpower, and in fire prevention programs may relate to variations in community fire losses.

a) Overall aggregate values	Fire losses per person ($) (1966-75)		
Mean ($\bar{X}$)	13.6		
Standard deviation (S)	9.3		
Maximum	77.4		
Minimum	2.2		
b) By region	$\bar{X}$	S	N
Atlantic	14.2	10.3	16
Québec	11.3	3.8	30
Ontario	12.8	5.4	35
Prairies	11.3	5.8	13
British Columbia	20.2	17.8	17

OTHER MEASURES

Additional indicators fall into two categories: (1) further documentation of the nature and extent of fire losses, and (2) measurement of the level of fire protection afforded to the community. Further measures of the scale of losses arising from fire include the number of injuries and deaths due to fires. The level of protective fire services is a function of numerous factors, for which indicators could potentially be developed, including the number, the training and experience of firefighting personnel, the quality of equipment possessed by the respective firefighting agencies and the water pressure maintained in the community's water supply system.

One particularly noteworthy indicator is the comprehensive rating for each community compiled by the assessors of the Insurers' Advisory Organization.[28] This measure involves the determination of deficiency points for each place by analyzing a broad array of variables including training of fire personnel, fire protection equipment, water systems, age and structure of buildings, and climatic conditions.

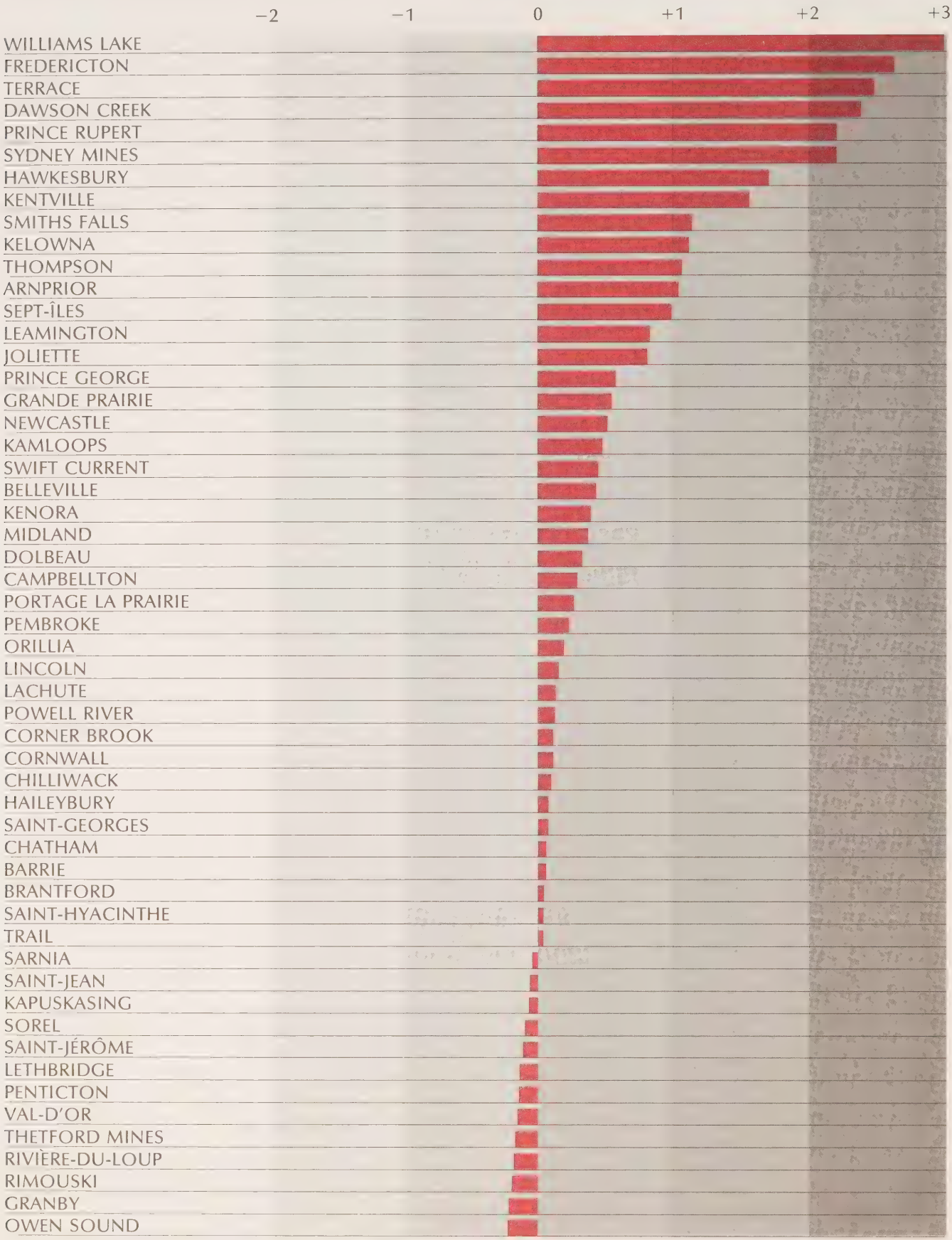
[28]Insurers' Advisory Organization, Public Fire Protection Survey Services, *Public Fire Protection Underwriting Bulletin* (Toronto: 1977).

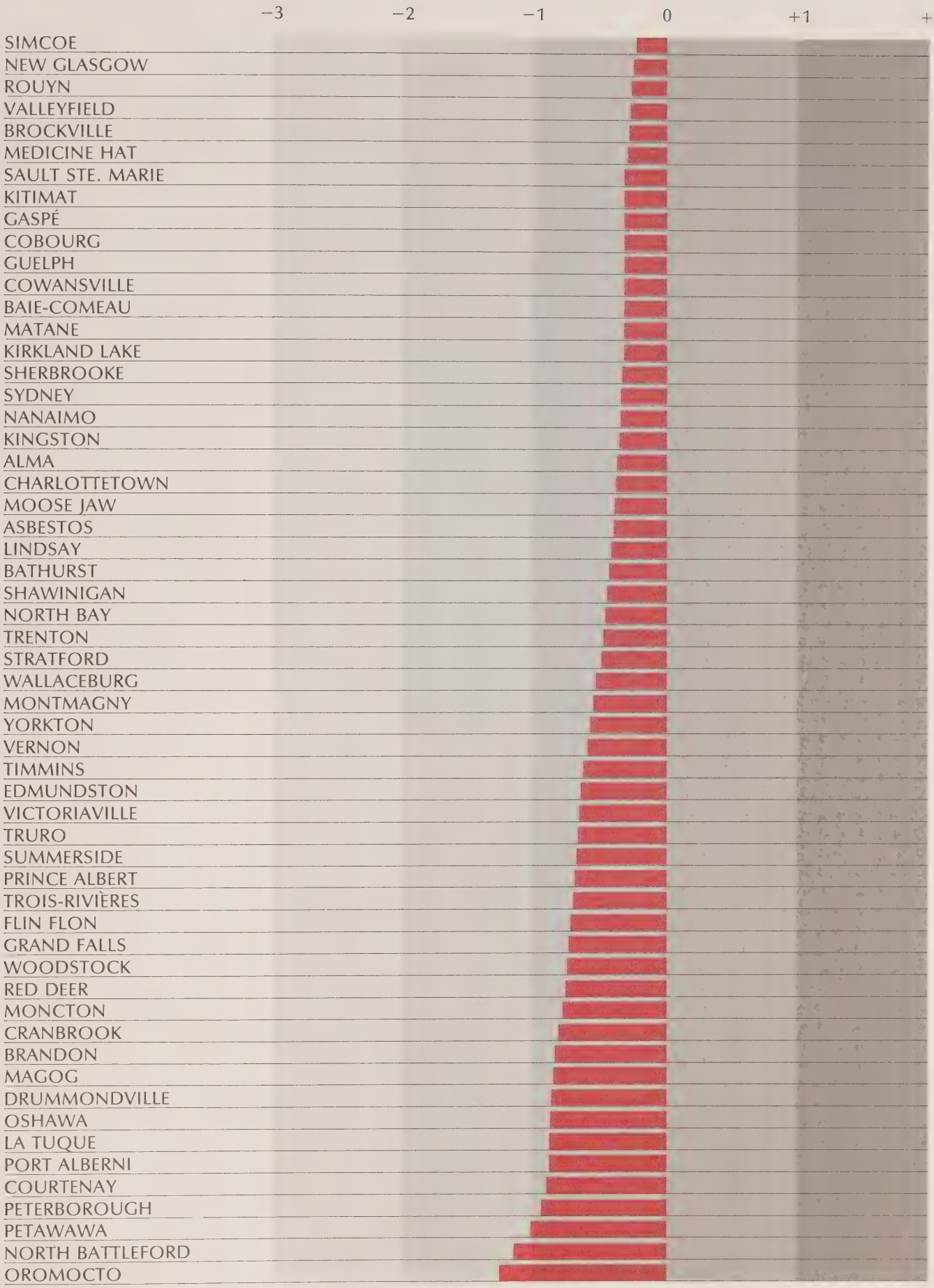
TABLE 35. AVERAGE ANNUAL FIRE LOSSES: DOLLARS PER PERSON (1966-75)

ATLANTIC REGION	Bathurst	8.70	Moncton*	6.62
	Campbellton*	15.97	Newcastle*	18.19
	Charlottetown*	9.23	New Glasgow*	11.18
	Corner Brook	15.32	Oromocto	2.18
	Edmundston	8.00	Summerside*	7.86
	Fredericton*	38.30	Sydney*	9.61
	Grand Falls*	7.26	Sydney Mines*	33.40
	Kentville*	27.32	Truro*	7.86
	Labrador City*	+		
QUÉBEC REGION	Alma	9.25	Rivière-du-Loup	11.65
	Asbestos*	9.05	Rouyn*	11.04
	Baie-Comeau*	9.74	Saint-Georges*	14.35
	Cowansville	9.99	Saint-Hyacinthe*	13.73
	Dolbeau*	16.02	Saint-Jean*	12.96
	Drummondville*	6.25	Saint-Jérôme*	12.43
	Gaspé	10.23	Sept-Îles	22.78
	Granby*	11.62	Shawinigan*	8.68
	Joliette*	20.79	Sherbrooke*	9.64
	Lachute*	15.42	Sorel*	12.52
	La Tuque	5.74	Thetford Mines*	11.73
	Magog*	6.29	Trois-Rivières*	7.40
	Matane	9.73	Val-d'Or*	12.21
	Montmagny	8.34	Valleyfield*	11.03
	Rimouski*	11.63	Victoriaville*	7.90
ONTARIO REGION	Arnprior*	23.10	Midland*	16.60
	Barrie*	14.12	North Bay	8.62
	Belleville	16.88	Orillia	15.60
	Brantford*	14.00	Oshawa*	6.07
	Brockville	10.83	Owen Sound	11.59
	Chatham	14.30	Pembroke*	15.62
	Cobourg*	10.21	Petawawa*	3.85
	Cornwall	15.20	Peterborough*	4.88
	Guelph*	10.18	Sarnia*	13.32
	Haileybury*	14.42	Sault Ste. Marie*	10.57
	Hawkesbury*	28.24	Simcoe	11.58
	Kapuskasing	12.78	Smiths Falls*	24.00
	Kenora*	16.76	Stratford	8.53
	Kingston*	9.49	Timmins*	8.00
	Kirkland Lake	9.73	Trenton*	8.62
	Leamington	21.27	Wallaceburg	8.44
	Lincoln	15.58	Woodstock	7.14
	Lindsay	9.02		
PRAIRIES REGION	Brandon	6.42	Portage la Prairie	15.75
	Flin Flon*	7.38	Prince Albert	7.76
	Grande Prairie	18.20	Red Deer	6.82
	Lethbridge	12.23	Swift Current	17.45
	Medicine Hat*	10.77	Thompson	23.37
	Moose Jaw	9.20	Yorkton	8.12
	North Battleford*	2.90		
BRITISH COLUMBIA REGION	Chilliwack*	14.56	Port Alberni*	5.68
	Courtenay*	5.44	Powell River	15.37
	Cranbrook	6.50	Prince George*	18.31
	Dawson Creek	35.08	Prince Rupert*	33.40
	Kamloops*	17.84	Terrace*	36.74
	Kelowna*	23.61	Trail*	13.63
	Kitimat	10.34	Vernon	8.05
	Nanaimo*	9.50	Williams Lake*	77.36
	Penticton	12.23		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1971 boundary).
+Data not available.
SOURCE: Public Works Canada, *Fire Losses in Canada: Report of the Dominion Fire Commissioner,* Annual (Ottawa: for the years 1966-75).

GRAPH 33. ANNUAL AVERAGE FIRE LOSSES: DOLLARS PER PERSON (1966-75)
(Z Scores)

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SIMCOE
NEW GLASGOW
ROUYN
VALLEYFIELD
BROCKVILLE
MEDICINE HAT
SAULT STE. MARIE
KITIMAT
GASPÉ
COBOURG
GUELPH
COWANSVILLE
BAIE-COMEAU
MATANE
KIRKLAND LAKE
SHERBROOKE
SYDNEY
NANAIMO
KINGSTON
ALMA
CHARLOTTETOWN
MOOSE JAW
ASBESTOS
LINDSAY
BATHURST
SHAWINIGAN
NORTH BAY
TRENTON
STRATFORD
WALLACEBURG
MONTMAGNY
YORKTON
VERNON
TIMMINS
EDMUNDSTON
VICTORIAVILLE
TRURO
SUMMERSIDE
PRINCE ALBERT
TROIS-RIVIÈRES
FLIN FLON
GRAND FALLS
WOODSTOCK
RED DEER
MONCTON
CRANBROOK
BRANDON
MAGOG
DRUMMONDVILLE
OSHAWA
LA TUQUE
PORT ALBERNI
COURTENAY
PETERBOROUGH
PETAWAWA
NORTH BATTLEFORD
OROMOCTO

TELEVISION VIEWING: NUMBER OF CABLE TV CHANNELS RECEIVED (1975)

ASPECT MEASURED

The number of cable television channels received measures the breadth of cultural programming, entertainment, news coverage and social commentary available to the resident viewer from the electronic media.

The importance of the role played by television in the life of the average Canadian should not be underestimated. National time-use surveys show that television viewing has become the single most dominant activity indulged in by most people during their leisure hours. Among home entertainment activities, the hours that Canadians devote to watching television far outnumber those spent reading newspapers, listening to records, playing musical instruments or pursuing hobbies. But the impact of television on the population as a whole is not uniform. Survey results indicate that youth, the elderly and low-income people spend significantly more time viewing television than do others.

As those who faithfully tune in to Saturday night hockey, Sunday football, the late movie or a host of situation comedies will attest, television has a substantial entertainment component. But television viewing can also serve other purposes such as provision of news coverage, instructional programs and local community information.

Although quantity is not necessarily synonymous with quality, it is generally true that the reception of more television channels proves beneficial. Among the benefits derived by the viewer are access to a greater selection of programming and increased flexibility in choice of times to view particular programs. The opportunity for viewers to take advantage of learning experiences offered on educational television networks, such as TV Ontario, is generally enhanced by a wider selection of channels. Also, the programming produced on community television stations operated by local cable companies provides resident viewers with announcements on local happenings and the diverse perspectives of various community spokesmen on local issues. In this manner, the local community channel may serve to broaden residents' awareness of important local issues and increase the level of interaction between different segments of the community.

In all, television programming in its various forms has the potential to enrich the quality of life for many citizens, perhaps especially so in isolated resource communities which provide few alternative leisure-time pursuits.

URBAN PATTERN

Significant variation is evident by city and by region. The availability of cable television installations and the number of channels received is higher for cities located in the two central provinces and lower for communities situated in the Atlantic and Western provinces. With regard to the diversity of television programming available, city size is not an influential factor; however, location in southern Ontario or southern Québec, where the density of cable TV companies is highest and American television signals are nearest, is of paramount importance. Typically, the communities most deprived of choice in television programming are those resource centres which are distant from major concentrations of population (e.g., Grand Falls, Gaspé, Kapuskasing, Kitimat and Dawson Creek).

a) Overall aggregate values	Channels received		
Mean ($\bar{X}$)	5.5		
Standard deviation(S)	4.5		
Maximum	17.0		
Minimum	0.0		
b) By region	$\bar{X}$	S	N
Atlantic	3.5	3.0	17
Québec	6.4	4.4	30
Ontario	7.8	5.0	35
Prairies	1.2	2.0	13
British Columbia	4.1	2.6	17

OTHER MEASURES

Potential measures are of three types: (1) indicators of the supply of television programming, (2) indicators of the demand for television programming, and (3) measures for other leisure activities of a similar nature.

On the supply side, measures of quantity include the number of channels received in households not served by cable companies, while measures of quality encompass indices of signal strength or the "watchability" of given TV channels in an area as determined by survey measures. Composite measures of television reception which sum the video reception rating per channel by the number of channels received have also been proposed.[29]

On the demand side are a number of measures of varying degrees of utility, sophistication and feasibility. The most easily constructed indicator for which data are readily available is the proportion of households having one or more colour television sets. More useful, but less feasible due to the lack of comparable data at the community level, are measures of the proportion of time residents normally spend watching television.[30] The time-use measure could, in theory, be extended on a community basis to consider both the characteristics of the viewers by age, sex, income and ethnicity as well as the kinds of programs watched, such as entertainment, educational, news and community-oriented.

Other passive, home-based leisure pursuits that also provide entertainment, relaxation and increased awareness through cultural, musical or information functions are listening to the radio or stereo system and reading newspapers, magazines and books. Measures of a similar type could be devised for each of these pastimes.

[29]D.R. Maki, F.C. Williams and R.M.S. Mirza, "Economic Benefits of Improved Television Services to Remote British Columbia Communities". Report prepared for Communications Canada (Vancouver: Simon Fraser University, 1976).

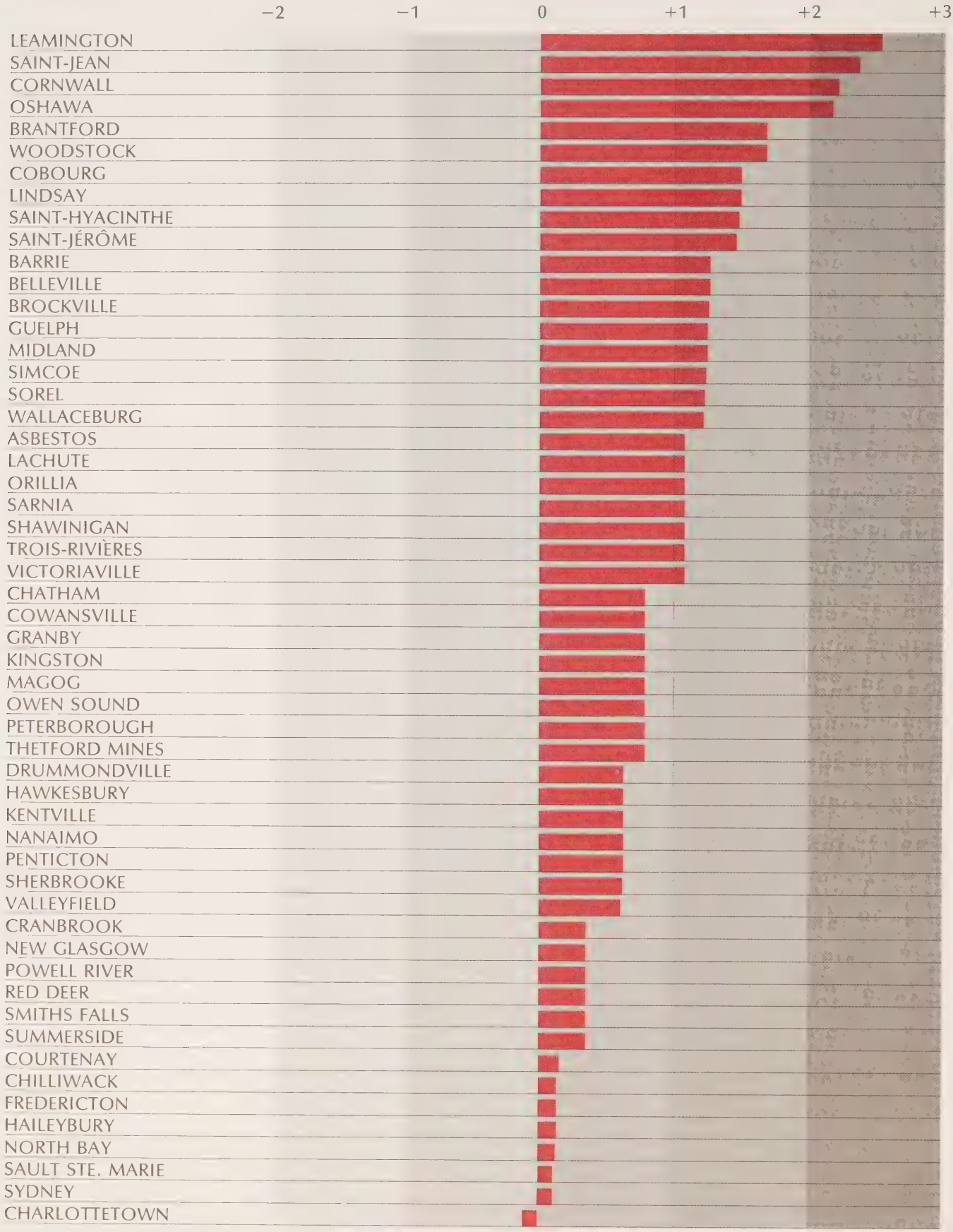
[30]SOURCES INCLUDE: Statistics Canada, Education, Science and Culture Division, *Survey of Fitness, Physical Recreation and Sport* (Ottawa: 1976); Statistics Canada, Education, Science and Culture Division, *Survey of Leisure Time Activities and Reading Habits* (Ottawa: 1976).

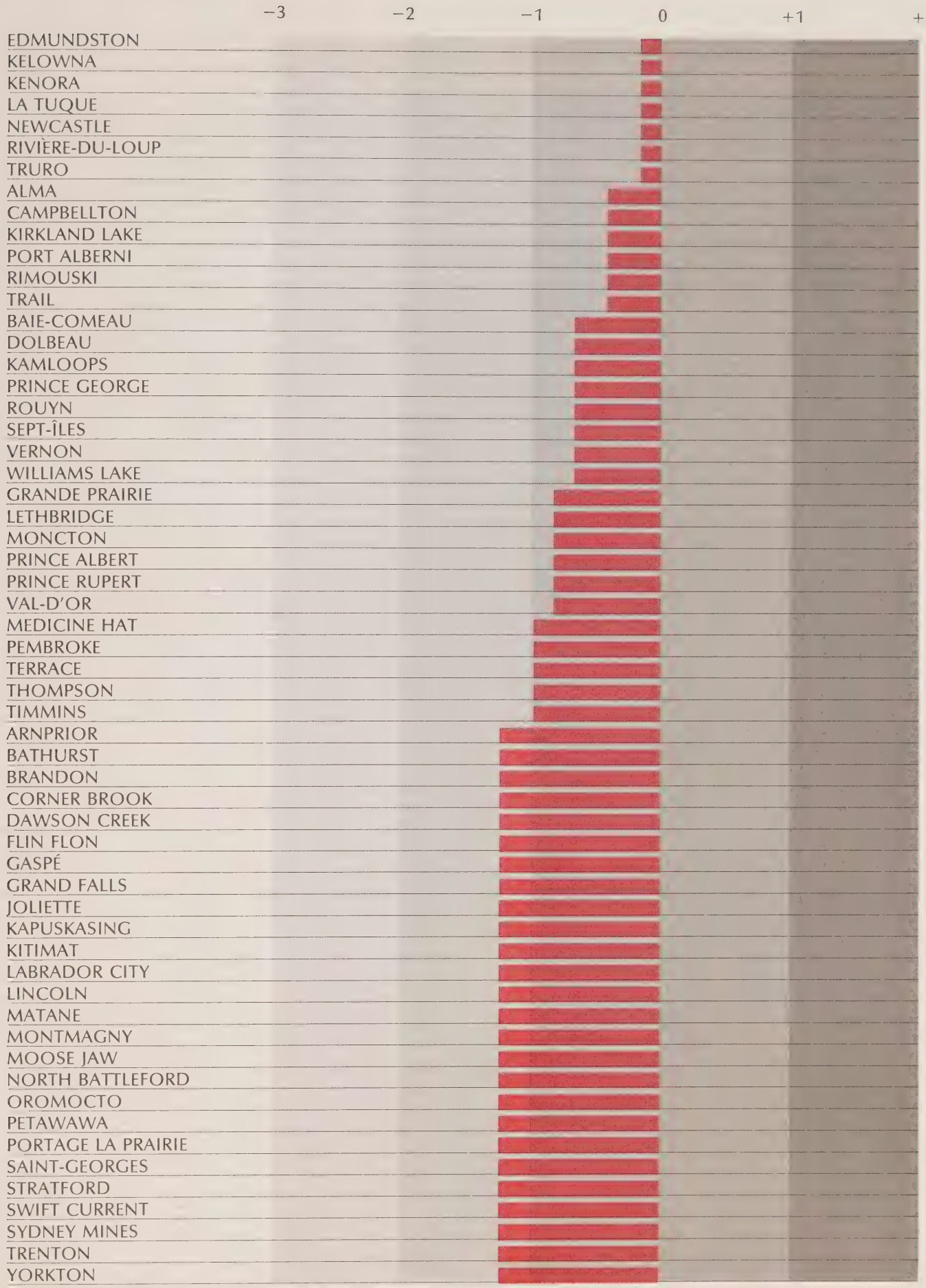
TABLE 36. NUMBER OF CABLE TV CHANNELS RECEIVED (1975)

ATLANTIC REGION	Bathurst	—	Moncton*	2
	Campbellton*	4	Newcastle*	5
	Charlottetown*	5	New Glasgow*	7
	Corner Brook	—	Oromocto	—
	Edmundston	5	Summerside*	7
	Fredericton*	6	Sydney*	6
	Grand Falls*	—	Sydney Mines*	—
	Kentville*	8	Truro*	5
	Labrador City*	—		
QUÉBEC REGION	Alma	4	Rivière-du-Loup	5
	Asbestos*	10	Rouyn*	3
	Baie-Comeau*	3	Saint-Georges*	—
	Cowansville	9	Saint-Hyacinthe*	12
	Dolbeau*	3	Saint-Jean*	16
	Drummondville*	8	Saint-Jérôme*	12
	Gaspé	—	Sept-Îles	3
	Granby*	9	Shawinigan*	10
	Joliette*	—	Sherbrooke*	8
	Lachute*	10	Sorel*	11
	La Tuque	5	Thetford Mines*	9
	Magog*	9	Trois-Rivières*	10
	Matane	—	Val-d'Or*	2
	Montmagny	—	Valleyfield*	8
	Rimouski*	4	Victoriaville*	10
ONTARIO REGION	Arnprior*	—	Midland*	11
	Barrie*	11	North Bay	6
	Belleville	11	Orillia	10
	Brantford*	13	Oshawa*	15
	Brockville	11	Owen Sound	9
	Chatham	9	Pembroke*	1
	Cobourg*	12	Petawawa*	—
	Cornwall	15	Peterborough*	9
	Guelph*	11	Sarnia*	10
	Haileybury*	6	Sault Ste. Marie*	6
	Hawkesbury*	8	Simcoe	11
	Kapuskasing	4	Smiths Falls*	7
	Kenora*	5	Stratford	—
	Kingston*	9	Timmins*	1
	Kirkland Lake	4	Trenton*	—
	Leamington	17	Wallaceburg	11
	Lincoln	—	Woodstock	13
	Lindsay	12		
PRAIRIES REGION	Brandon	—	Portage la Prairie	—
	Flin Flon*	—	Prince Albert	2
	Grande Prairie	2	Red Deer	7
	Lethbridge	2	Swift Current	—
	Medicine Hat*	1	Thompson	1
	Moose Jaw	—	Yorkton	—
	North Battleford*	—		
BRITISH COLUMBIA REGION	Chilliwack*	6	Port Alberni*	4
	Courtenay*	6	Powell River	7
	Cranbrook	7	Prince George*	3
	Dawson Creek	—	Prince Rupert*	2
	Kamloops*	3	Terrace*	1
	Kelowna*	5	Trail*	4
	Kitimat	—	Vernon	3
	Nanaimo*	8	Williams Lake*	3
	Penticton	8		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
— indicates no existing cable TV service.
SOURCE: Department of Regional Economic Expansion, Economic Development Analysis Division, *DREE Community Data Files*, 1978. Derived from: Canadian Radio and Television Commission (CRTC) Cable Television Systems in Canada (Ottawa: 1975).

GRAPH 34. NUMBER OF CABLE TV CHANNELS RECEIVED (1975)
(Z Scores)




−3
−2
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+1
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EDMUNDSTON
KELOWNA
KENORA
LA TUQUE
NEWCASTLE
RIVIÈRE-DU-LOUP
TRURO
ALMA
CAMPBELLTON
KIRKLAND LAKE
PORT ALBERNI
RIMOUSKI
TRAIL
BAIE-COMEAU
DOLBEAU
KAMLOOPS
PRINCE GEORGE
ROUYN
SEPT-ÎLES
VERNON
WILLIAMS LAKE
GRANDE PRAIRIE
LETHBRIDGE
MONCTON
PRINCE ALBERT
PRINCE RUPERT
VAL-D'OR
MEDICINE HAT
PEMBROKE
TERRACE
THOMPSON
TIMMINS
ARNPRIOR
BATHURST
BRANDON
CORNER BROOK
DAWSON CREEK
FLIN FLON
GASPÉ
GRAND FALLS
JOLIETTE
KAPUSKASING
KITIMAT
LABRADOR CITY
LINCOLN
MATANE
MONTMAGNY
MOOSE JAW
NORTH BATTLEFORD
OROMOCTO
PETAWAWA
PORTAGE LA PRAIRIE
SAINT-GEORGES
STRATFORD
SWIFT CURRENT
SYDNEY MINES
TRENTON
YORKTON

ASPECT MEASURED

The weekly circulation of local newspapers per 1000 population measures the degree to which the resident population seeks access to news, editorial commentary and entertainment features as a leisure-time activity. The measure, copies circulated per week, also indicates the availability to citizens of advertising and information on local community events, meetings, programs and products. The level of local information available presumably affects people's level of awareness and involvement in community activities.

Although the amount of time that most people devote to reading newspapers is considerably less than the time spent watching television, the national time-use survey indicates that there are relatively few Canadians aged fourteen and over who never glance through a newspaper during the course of a week. The hours spent per week reading newspapers does not differ markedly according to the age or income level of residents, although there exists a slight tendency for the middle-aged, the elderly and the high-income groups to peruse newspapers for a longer period of time. Newspaper reading, therefore, seems to occupy a limited, but consistent, place in Canadians' use of leisure time.

The measure, weekly circulation per 1000 population, focusses exclusively on newspapers that are published locally within the community. The circulation of large metropolitan dailies, which may have significant market penetration in the smaller urban areas, has not been included. Also excluded from the calculations are newspapers oriented to a specialized readership within the city, such as the so-called "ethnic press". These restrictions were imposed in order to focus on the media sector most likely to disseminate information to residents on local issues, happenings and programs that would enhance their level of awareness and involvement within their city.

In accordance with demand and resources, local newspapers have varying publication schedules ranging from daily editions through to twice-weekly and bi-weekly editions. For the sake of consistency, the circulation level for all newspapers has been standardized to a weekly basis. Hence, the circulation for daily editions has been multiplied by six while the distribution of bi-weekly papers has been divided by two. In cities where several local newspapers are in business, the weekly circulation of each is summed.

DIFFICULTIES OF INTERPRETATION

Circulation levels for local newspapers include the total circulation to both residents within the city and the readership in the immediately surrounding region. Since the precise delineation of the trade areas for all newspapers located in the cities under study would be an immense task, the measure, copies per week per 1000 population, was determined with reference to only the population of the city or census agglomeration in which the newspaper is published. Given the differences in the spatial extent and population density of the encircling market area, some variation exists in the proportion of "outside" circulation by local newspapers. The variation introduces an element of distortion into the results. Hence, the measure should only be seen as indicating broad trends rather than allowing for definitive comparisons between pairs of centres.

URBAN PATTERN

Significant differences in the regional averages are apparent. Weekly newspaper circulation in Prairie cities is, on average, almost three times the level of circulation in Québec cities. Communities in Ontario, the Prairies and the Maritimes experience high levels of newspaper circulation, levels in B.C. cities are about on par with the national average, while Québec centres are considerably below average.

Overall variation among cities is high as evidenced by the range (7080.0) and the coefficient of variations ($S/\bar{X}$) = (1347/1532) = 0.87. When the circulation levels for each centre are standardized and the scores are ranked, as is displayed in the histogram, strong regional differences are evident. Of the 21 places which have scores lower than -1.0, more than half are located in Québec. Centres in which local newspaper circulation is minimal or non-existent tend to include military towns (e.g., Petawawa, Trenton and Chilliwack), resource processing centres (e.g., Labrador City, Sept-Îles, Dolbeau, La Tuque, Thetford Mines and Williams Lake) and cities in economically peripheral areas (e.g., Gaspé).[31]

a) Overall aggregate values

	Weekly circulation per 1000 population (1975)
Mean ($\bar{X}$)	1532
Standard deviation (S)	1347
Maximum	7080
Minimum	0

b) By region

	$\bar{X}$	S	N
Atlantic	1846	1535	17
Québec	774	830	30
Ontario	1934	1588	35
Prairies	2167	996	13
British Columbia	1244	964	17

[31]Given that newspapers servicing resource communities located in isolated regions of the Canadian Shield are less likely to have a high readership outside the city itself, due to the sparseness of the surrounding population, it is possible that the method of constructing the measure has caused the circulation levels for northern centres to appear comparatively low.

OTHER MEASURES

Alternative measures include indicators of the supply of newspaper information, indicators of access to newspaper information and measures for other passive leisure-time pursuits of a similar nature. If resources for data collection are available and more refined measures are required, comparative indicators of community newspaper content could be devised by determining, for example, the mean number of column inches devoted to entertainment, community news, local announcements, etc., per newspaper issue.[32]

More refined measures of access and usage of local newspapers that could be developed from community survey results would seek to answer the questions: Who reads the newspaper? For how long? and, What do they read?[33] Based on extensive time-use surveys, the average proportion of time that residents expend reading newspapers could be calculated. Conceptually, this time-allocation measure could be refined to provide a socio-demographic profile of the readership by age, education, occupation, etc., and a picture of the kinds of articles and announcements actually read such as news coverage, community events and local business advertising.

[32]For further information, readers are referred to: Statistics Canada, Education, Science and Culture Division, *Distribution and Content of Newspapers and Magazines,* Cat. 87-625, 1978.

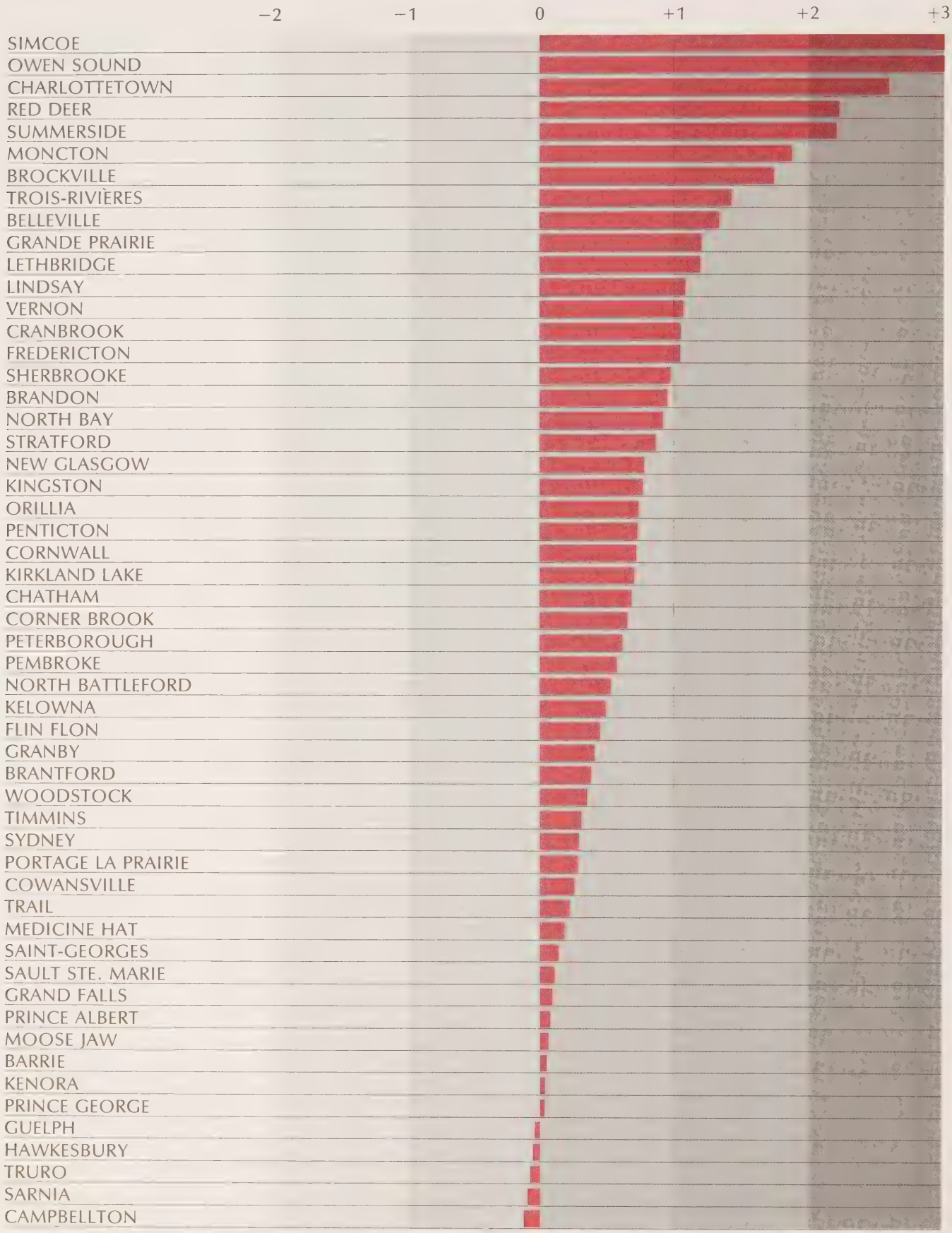
[33]At the national scale, some answers to these questions will be available from: Statistics Canada, Education, Science and Culture Division, *Survey of Fitness, Physical Recreation and Sport,* 1976; Statistics Canada, Education, Science and Culture Division, *Survey of Leisure Time Activities and Reading Habits,* 1978.

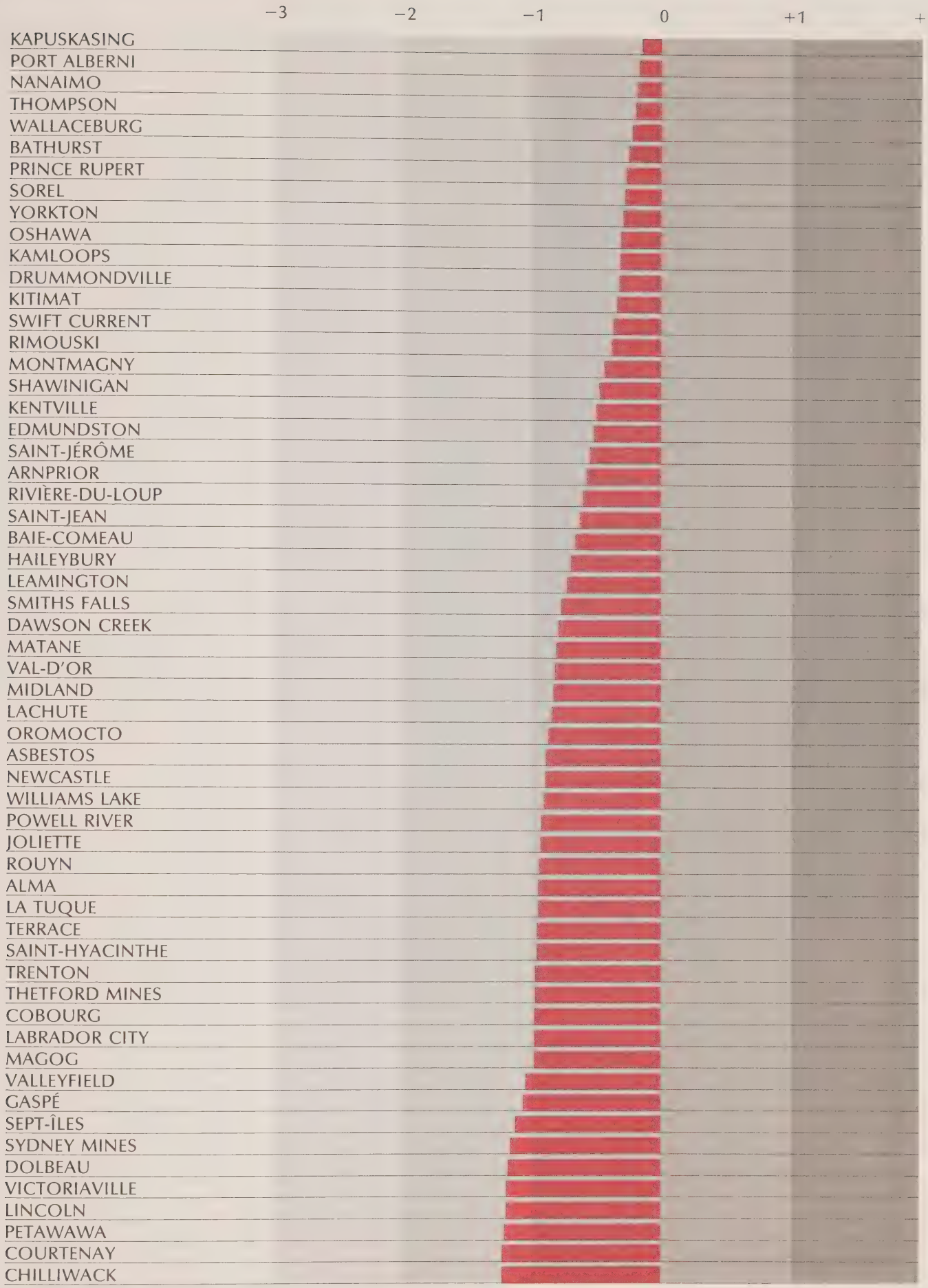
TABLE 37. LOCAL NEWSPAPER CIRCULATION: COPIES PER WEEK PER 1000 POPULATION (1975)

ATLANTIC REGION	Bathurst	1193	Moncton*	3956
	Campbellton*	1382	Newcastle*	383
	Charlottetown*	5185	New Glasgow*	2477
	Corner Brook	2260	Oromocto	447
	Edmundston	711	Summerside*	4470
	Fredericton*	2916	Sydney*	1967
	Grand Falls*	1642	Sydney Mines*	0
	Kentville*	742	Truro*	1400
	Labrador City*	234		
QUÉBEC REGION	Alma	289	Rivière-du-Loup	613
	Asbestos*	393	Rouyn*	313
	Baie-Comeau*	571	Saint-Georges*	1776
	Cowansville	1906	Saint-Hyacinthe*	272
	Dolbeau*	0	Saint-Jean*	609
	Drummondville*	1069	Saint-Jérôme*	709
	Gaspé	88	Sept-Îles	0
	Granby*	2079	Shawinigan*	804
	Joliette*	323	Sherbrooke*	2857
	Lachute*	455	Sorel*	1145
	La Tuque	281	Thetford Mines*	261
	Magog*	228	Trois-Rivières*	3312
	Matane	479	Val-d'Or*	475
	Montmagny	847	Valleyfield*	107
	Rimouski*	932	Victoriaville*	0
ONTARIO REGION	Arnprior*	675	Midland*	471
	Barrie*	1550	North Bay	2723
	Belleville	3284	Orillia	2412
	Brantford*	2045	Oshawa*	1110
	Brockville	3714	Owen Sound	6982
	Chatham	2278	Pembroke*	2201
	Cobourg*	252	Petawawa*	0
	Cornwall	2377	Peterborough*	2222
	Guelph*	1508	Sarnia*	1395
	Haileybury*	539	Sault Ste. Marie*	1660
	Hawkesbury*	1431	Simcoe	7079
	Kapuskasing	1334	Smiths Falls*	485
	Kenora*	1545	Stratford	2594
	Kingston*	2428	Timmins*	2026
	Kirkland Lake	2326	Trenton*	263
	Leamington	519	Wallaceburg	1207
	Lincoln	0	Woodstock	2038
	Lindsay	2976		
PRAIRIES REGION	Brandon	2822	Portage la Prairie	1957
	Flin Flon*	2089	Prince Albert	1631
	Grande Prairie	3161	Red Deer	4472
	Lethbridge	3146	Swift Current	956
	Medicine Hat*	1806	Thompson	1231
	Moose Jaw	1595	Yorkton	1128
	North Battleford*	2169		
BRITISH COLUMBIA REGION	Chilliwack*	0	Port Alberni*	1291
	Courtenay*	0	Powell River	348
	Cranbrook	2971	Prince George*	1543
	Dawson Creek	482	Prince Rupert*	1182
	Kamloops*	1093	Terrace*	278
	Kelowna*	2151	Trail*	1836
	Kitimat	963	Vernon	2973
	Nanaimo*	1275	Williams Lake*	364
	Penticton	2398		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: *Canadian Advertizing Rates and Data.* (Toronto: Maclean-Hunter, January 1976), by kind permission of Canadian Advertising Rates and Data.

GRAPH 35. LOCAL NEWSPAPER CIRCULATION: COPIES PER WEEK PER 1000 POPULATION (1975)
(Z Scores)

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KAPUSKASING
PORT ALBERNI
NANAIMO
THOMPSON
WALLACEBURG
BATHURST
PRINCE RUPERT
SOREL
YORKTON
OSHAWA
KAMLOOPS
DRUMMONDVILLE
KITIMAT
SWIFT CURRENT
RIMOUSKI
MONTMAGNY
SHAWINIGAN
KENTVILLE
EDMUNDSTON
SAINT-JÉRÔME
ARNPRIOR
RIVIÈRE-DU-LOUP
SAINT-JEAN
BAIE-COMEAU
HAILEYBURY
LEAMINGTON
SMITHS FALLS
DAWSON CREEK
MATANE
VAL-D'OR
MIDLAND
LACHUTE
OROMOCTO
ASBESTOS
NEWCASTLE
WILLIAMS LAKE
POWELL RIVER
JOLIETTE
ROUYN
ALMA
LA TUQUE
TERRACE
SAINT-HYACINTHE
TRENTON
THETFORD MINES
COBOURG
LABRADOR CITY
MAGOG
VALLEYFIELD
GASPÉ
SEPT-ÎLES
SYDNEY MINES
DOLBEAU
VICTORIAVILLE
LINCOLN
PETAWAWA
COURTENAY
CHILLIWACK

INCOME AND LABOUR FORCE

In this section, the focus is on factors related to the economic prosperity and employment of residents of the communities under study.

The indicators related to income can be treated as both input and output measures of local economic development. On one hand, as incomes increase, the potential market for local goods and services is increased. Thus, an increase in residents' incomes may stimulate local economic growth and, consequently, an increase in employment opportunities as well. On the other hand, the income level which is found in a community can be seen to be a function of the community's economic development. Generally, higher incomes are expected to be found in communities with high levels of economic activity and productivity.

The labour force indicators considered here are the unemployment rate and the female labour force participation rate. These indicators can be seen as output measures of economic development. Presumably, the more robust the local economy, the greater are the relative number and types of job opportunities. In turn it can be anticipated that the more job opportunities there are, the lower will be the rate of unemployment and the greater will be the female labour force participation rate.

The four measures reported here are seen to be related to the quality of life experienced by individuals as well as to the community's level of economic development. The ability to acquire goods and services, to obtain suitable housing and to pursue leisure-time activities is governed by an individual's income. In order to obtain income, individuals or members of their families must be able to find employment. Participation in the labour force may also have more direct consequences for the quality of life. Personal satisfaction may result from the utilization of acquired skills in a productive manner, while individuals who find themselves underemployed or locked into dull and tiring jobs may experience serious dissatisfaction which colours other aspects of their lives. Unemployment not only affects income and the ability to obtain the satisfaction money can buy, it may also affect individuals' feelings of self-worth. Particularly in societies where the work ethic is strong, those who cannot find employment are likely to view themselves as inadequate. Employment and income, thus, affect both the material rewards and the psychological gratifications individuals are able to obtain.

AVERAGE DISPOSABLE INCOME AFTER TAXES (1974)

ASPECT MEASURED

It is apparent that the amount of money a person has at his/her disposal has important consequences for the quality of life he/she can achieve. Perhaps less obvious is the positive effect that individual wealth can have on the community as a whole. Higher incomes mean a greater ability to purchase goods and services. Thus, as incomes go up in a community, the potential market for local businessmen increases. Expansion in the local economy in turn provides benefits in terms of greater employment opportunities and greater tax revenue to the municipality.

In this section, "average disposable income after taxes" is used as an indicator of the money individuals have available to spend in enhancing their own quality of life. This measure is calculated by subtracting the total value of all taxes payable in 1974 (both provincial and federal) from the total value of all tax returns and dividing the remainder by the total number of all returns.

It should be noted that, by examining all returns rather than just taxable returns, the measure covers low-income individuals, including those not in the labour force and those whose incomes were too low to be taxed.

For centres outside Québec, all of the data necessary for the calculation of the measures were available from Revenue Canada.[1] For centres in Québec, Revenue Canada reports only federal taxes payable. Provincial tax payable, therefore, had to be obtained from another source[2] and subtracted along with federal taxes payable. Some error results in the process in that the geographic units for which Québec taxes are reported are not always identical to units utilized by Revenue Canada.

DIFFICULTIES OF INTERPRETATION

Some of the more important difficulties with the measure involve its validity as an indicator of individuals' monetary situations. First, the measure is an average, a statistical abstraction, which tells us how much disposable income individuals would have if all had equal amounts. Consequently, the measure obscures real variations in the disposable income (and, consequently, in the quality of life) available to individuals within the communities studied. A second point is that the sharing of disposable income that goes on in families is ignored in the measure. To illustrate, a single person with a disposable income of $5 000 is clearly not as well off as a married person with the same income whose spouse has $10 000 of disposable income. Relatedly, the economic well-being of individuals is affected by the number of dependents they support, but this is not considered in the measure. A third problem with the measure is that differences in the cost of living between communities are not taken into account. Finally, the measure underestimates the financial well-being of the community and its residents in that accumulated wealth (e.g. assets in property, savings, etc.) is not taken into account.

Apart from the issue of the validity of the measure as an indicator of individual economic situations, there is at least one other problem with the measure. This is that the geographic units for which tax data are reported do not necessarily correspond exactly to the boundaries of census agglomerations or municipalities.

[1]Revenue Canada, *1974 Tax Year File Locality Code Statistics for all Returns*, unpublished tabulation (Ottawa: 1976).

[2]Ministère du Revenue du Québec, *Statistiques Fiscales 1974* (Québec: 1976), pp. 8-11.

URBAN PATTERN

The highest levels of disposable income are found in the western regions. British Columbia centres stand out as having the highest mean for average disposable income — $7 353.6. This average is well above the next highest score of $6 586.5 which is found in the Prairies. Centres in eastern regions have relatively low levels of disposable incomes as is reflected in regional means of $6 206.9 in the Atlantic, $6 330.6 in Québec and $6 272.3 in Ontario.

The greatest variation among communities in average disposable income scores is found in the Atlantic region (S = 734.3) while the least variation is found in the Prairies (S = 456.4). Quite possibly, the high level of variation among Atlantic communities is due to the heterogeneity of dominant economic functions found in the East, while the low variation in the Prairies is a result of similarity in the communities' economic function.

In general, average disposable income tends to be higher in centres which have a high proportion of youths, a low proportion of elderly, a high rate of population increase and a remote location. Since these characteristics fit many remote resource communities, it is not surprising that we find high values for average disposable income in centres such as Labrador City, Sept-Îles, Thompson, Kitimat and Port Alberni. In passing, it should be noted that the presence of a large number of resource centres in British Columbia may account for the high regional mean for that region.

Differences in industrial structures also appear to be related to differences in average disposable income. Centres dominated by large, mechanized, high technology industries (e.g., automobile, steel and petrochemical industries) feature high levels of disposable income (e.g., Oshawa, Sarnia and Sault Ste. Marie). On the other hand, communities supported by lower productivity, labour intensive industries (e.g., textiles, shoe manufacturing) have lower than average levels of disposable income (e.g., Granby, Saint-Hyacinthe, Saint-Jean).

	Average disposable income (1974)		
a) Overall aggregate values			
Mean ($\bar{X}$)	6481.3		
Standard deviation (S)	673.4		
Maximum	8914.0		
Minimum	5205.0		
b) By region	($\bar{X}$)	S	N
Atlantic	6206.9	734.3	17
Québec	6330.6	537.5	28
Ontario	6272.3	525.2	35
Prairies	6586.5	456.4	13
British Columbia	7353.6	536.2	17

OTHER MEASURES

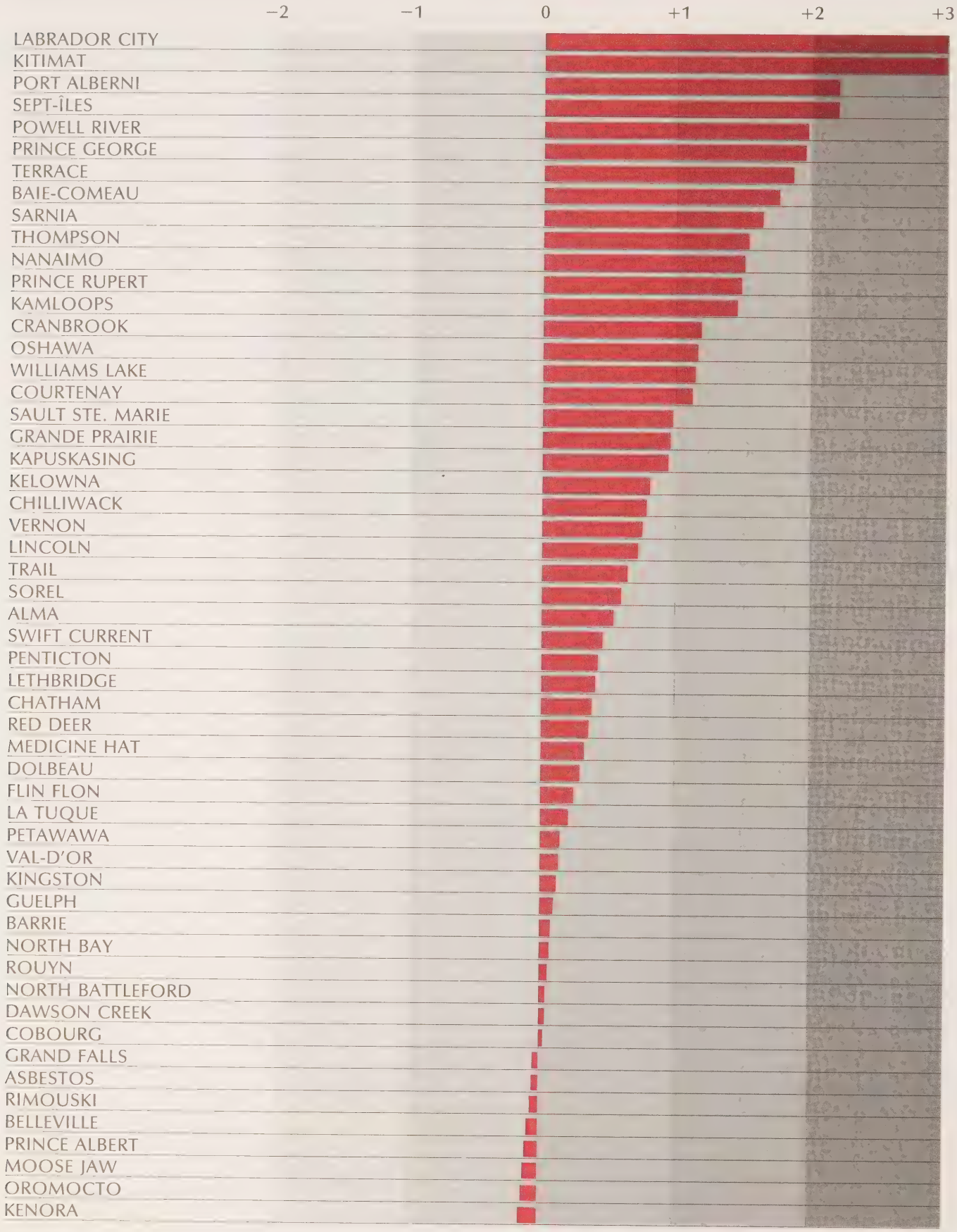
Alternative measures can resolve some of the difficulties encountered with the average disposable income measure. However, many of the potential alternatives have shortcomings of their own. For example, a more current measure, average wages and salaries, could be provided for urban areas with data from Labour Canada. However, this measure excludes income information on several major sections of the labour force as well as those outside the labour force (e.g., pensioners). A second possibility is to adjust income levels on the basis of the consumer price index to account for variations in the cost of living. Unfortunately, the consumer price index is only available at the national and provincial levels and for twelve metropolitan areas. Use of provincial level indices would likely obscure significant inter-city variations in the cost of living within regions.

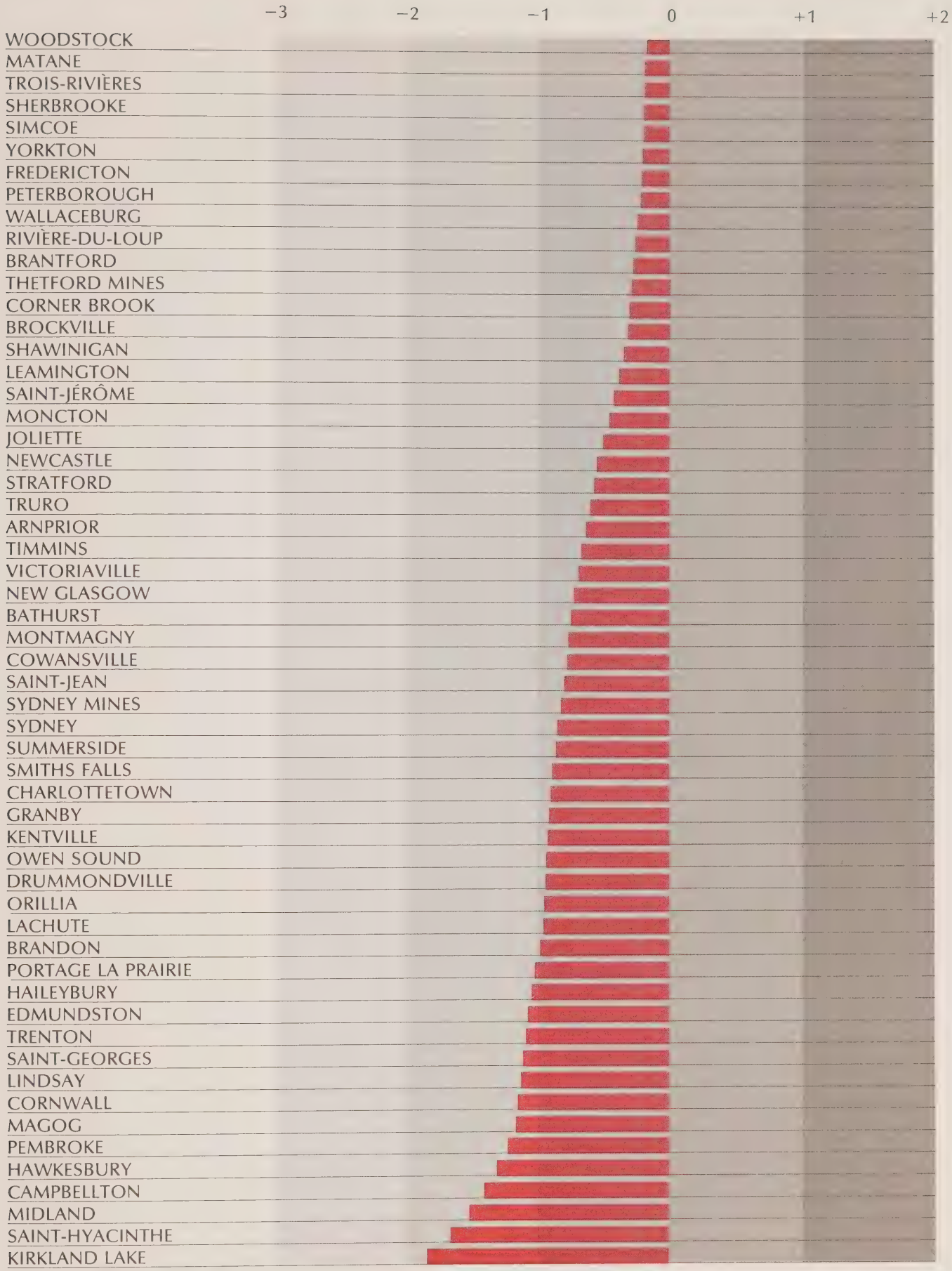
TABLE 38. AVERAGE DISPOSABLE INCOME AFTER FEDERAL AND PROVINCIAL TAXES FOR ALL TAX FILERS (1974) ($)

ATLANTIC REGION	Bathurst	5,997	Moncton*	6,141
	Campbellton*	5,559	Newcastle*	6,073
	Charlottetown*	5,903	New Glasgow*	6,004
	Corner Brook	6,254	Oromocto	6,397
	Edmundston	5,776	Summerside*	5,925
	Fredericton*	6,328	Sydney*	5,925
	Grand Falls*	6,475	Sydney Mines*	5,925
	Kentville*	5,896	Truro*	6,026
	Labrador City*	8,914		
QUÉBEC REGION	Alma	6,831	Rivière-du-Loup	6,293
	Asbestos*	6,434	Rouyn*	6,511
	Baie-Comeau*	7,581	Saint-Georges*	5,728
	Cowansville	5,986	Saint-Hyacinthe*	5,443
	Dolbeau*	6,746	Saint-Jean*	5,980
	Drummondville*	5,867	Saint-Jérôme*	6,150
	Gaspé	+	Sept-Îles	7,926
	Granby*	5,897	Shawinigan*	6,230
	Joliette*	6,125	Sherbrooke*	6,371
	Lachute*	5,844	Sorel*	6,880
	La Tuque	6,667	Thetford Mines*	6,272
	Magog*	5,708	Trois-Rivières*	6,374
	Matane	6,376	Val-d'Or*	6,600
	Montmagny	5,995	Valleyfield*	+
	Rimouski*	6,428	Victoriaville*	6,014
ONTARIO REGION	Arnprior*	6,022	Midland*	5,486
	Barrie*	6,551	North Bay	6,529
	Belleville	6,408	Orillia	5,858
	Brantford*	6,292	Oshawa*	7,233
	Brockville	6,246	Owen Sound	5,870
	Chatham	6,775	Pembroke*	5,638
	Cobourg*	6,495	Petawawa*	6,629
	Cornwall	5,710	Peterborough*	6,316
	Guelph*	6,338	Sarnia*	7,530
	Haileybury*	5,801	Sault Ste. Marie*	7,091
	Hawkesbury*	5,634	Simcoe	6,356
	Kapuskasing	7,030	Smiths Falls*	5,905
	Kenora*	6,387	Stratford	6,041
	Kingston*	6,588	Timmins*	6,017
	Kirkland Lake	5,205	Trenton*	5,769
	Leamington	6,193	Wallaceburg	6,306
	Lincoln	6,974	Woodstock	6,376
	Lindsay	5,712		
PRAIRIES REGION	Brandon	5,822	Portage la Prairie	5,804
	Flin Flon*	6,731	Prince Albert	6,405
	Grande Prairie	7,042	Red Deer	6,760
	Lethbridge	6,787	Swift Current	6,805
	Medicine Hat*	6,748	Thompson	7,477
	Moose Jaw	6,405	Yorkton	6,332
	North Battleford*	6,508		
BRITISH COLUMBIA REGION	Chilliwack*	6,985	Port Alberni*	7,947
	Courtenay*	7,203	Powell River	7,767
	Cranbrook	7,233	Prince George*	7,717
	Dawson Creek	6,495	Prince Rupert*	7,425
	Kamloops*	7,413	Terrace*	7,674
	Kelowna*	6,997	Trail*	6,890
	Kitimat	8,803	Vernon	6,981
	Nanaimo*	7,460	Williams Lake*	7,229
	Penticton	6,792		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: Calculated from Revenue Canada, *1974 Tax Year File — Locality Code Statistics for All Returns*, unpublished tabulation (Ottawa: 1976). For Québec provincial tax: Ministère du Revenue du Québec, *Statistiques Fiscales 1974* (Québec: 1976), pp. 8-11.

GRAPH 36. AVERAGE DISPOSABLE INCOME AFTER FEDERAL AND PROVINCIAL TAXES FOR ALL TAX FILERS (1974) ($) (Z Scores)




−3
−2
−1
0
+1
+2
WOODSTOCK
MATANE
TROIS-RIVIÈRES
SHERBROOKE
SIMCOE
YORKTON
FREDERICTON
PETERBOROUGH
WALLACEBURG
RIVIÈRE-DU-LOUP
BRANTFORD
THETFORD MINES
CORNER BROOK
BROCKVILLE
SHAWINIGAN
LEAMINGTON
SAINT-JÉRÔME
MONCTON
JOLIETTE
NEWCASTLE
STRATFORD
TRURO
ARNPRIOR
TIMMINS
VICTORIAVILLE
NEW GLASGOW
BATHURST
MONTMAGNY
COWANSVILLE
SAINT-JEAN
SYDNEY MINES
SYDNEY
SUMMERSIDE
SMITHS FALLS
CHARLOTTETOWN
GRANBY
KENTVILLE
OWEN SOUND
DRUMMONDVILLE
ORILLIA
LACHUTE
BRANDON
PORTAGE LA PRAIRIE
HAILEYBURY
EDMUNDSTON
TRENTON
SAINT-GEORGES
LINDSAY
CORNWALL
MAGOG
PEMBROKE
HAWKESBURY
CAMPBELLTON
MIDLAND
SAINT-HYACINTHE
KIRKLAND LAKE

AVERAGE FAMILY INCOME (1971)

ASPECT MEASURED

Often a person's financial well-being is more a function of the family he or she is a member of than of the income accruing to the person alone. Through the pooling of economic resources and the sharing of goods and services purchased, the family unit helps individuals within it to achieve higher standards of living than would be possible if they had only their own incomes.

Average total family income in each centre is expressed as a percentage of the average total family income for urban Canada ($10 502) in 1971. For example, the score reported for a centre where the average (total) family income was $15 000 in 1971 would be 143 per cent.[3] It should be noted that family income refers to the sum of all income to family members over the age of fifteen from wages and salaries, self-employment, farm operations, family and youth allowances, pensions, investment income, etc.[4] Use of the percentage index facilitates the comparison of incomes levels between communities without emphasizing the actual income levels which are quite out-of-date (1971 Census).

PROBLEMS OF INTERPRETATION

It should be stressed that the measure used here is meant to indicate the financial well-being of families and only indirectly that of the community's total population. This said, there are a number of problems associated with the measure which should be mentioned.

First, the measure does not provide information on the actual distribution of family incomes. While it is likely that the shape of most community income distributions will be similar, it is possible that some communities will differ significantly in the proportions of low-income and high-income families they contain. Consequently, caution must be exercised in using this measure to make statements about the economic well-being of families in the communities under study. A second problem is that the measure does not take into account factors other than income which affect families' financial well-being (e.g., savings, property holdings, number of dependants, cost of living, taxes, debts, etc.). Third, yearly fluctuations in family income are not considered. Where the local economy is subject to relatively rapid change, families may find it difficult to make long-term financial commitments (e.g., purchase of a house). Finally, the data on which the measure is based are out-of-date (1971 Census). Unfortunately, family income data are not available from Revenue Canada and were not collected in the 1976 Census.

[3] $[(15\ 000 \div 10\ 502) \times 100] = 143$

[4] For a more detailed listing of included income sources see Statistics Canada, 1977, Cat. 93-713, pp. 43-44.

The mean score for all non-metropolitan centres is 88.3 per cent of the national average. This indicates that the average family income in medium-sized centres tends to be less than the average income in all of urban Canada. However, family income levels vary among the 112 cities. In general, communities in British Columbia and Ontario are closer to the national mean than communities in other regions.[5] On the other hand, Atlantic centres tend to fall far below the national urban average and also show the greatest variation among themselves in average family income.

Looking across regions, it becomes possible to identify several tendencies. Higher average family incomes tend to be found in three types of communities. First, remote resource centres (e.g., Labrador City, Thompson, Sept-Îles, Prince George and Terrace) have high averages, perhaps due to pay incentives provided to encourage workers to locate in remote areas. Second, higher family incomes are associated with highly industrialized centres such as Sarnia, Sault Ste. Marie and Oshawa. Finally, communities which can be classified as university towns and centres of public administration (e.g., Charlottetown, Fredericton, Guelph and Kingston) also have higher average family-income scores.

Community characteristics associated with low family income are more difficult to identify. However, it is interesting to note that 16 of the 20 communities with the lowest averages are located in the Atlantic and Québec regions, suggesting the overriding effect of regional economics on local income averages.

In passing, it is worth noting some of the correlations that exist between average family income and other variables considered in this report. In communities where the average family income is high there are fewer individuals with educational attainment levels of grade ten or less and also higher dollar values for owner-occupied dwellings.

The level of average family income also co-varies with the ethnic composition of smaller cities. In centres where the ethnic diversity index is higher there tend to be higher average family incomes. In fact, this relationship may stem from a tendency on the part of immigrants to settle in economic growth centres.

[5]For ease of discussion, the term average family income will be utilized in place of average family income as a percentage of the average family income for urban Canada.

a)	Overall aggregate values	Average family income (1971)		
	Mean ($\bar{X}$)	88.3		
	Standard deviation (S)	9.7		
	Maximum	119.0		
	Minimum	66.0		
b)	By region	$\bar{X}$	S	N
	Atlantic	81.8	11.5	17
	Québec	83.8	7.9	30
	Ontario	93.0	7.3	35
	Prairies	86.8	8.9	13
	British Columbia	94.3	7.7	17

OTHER MEASURES

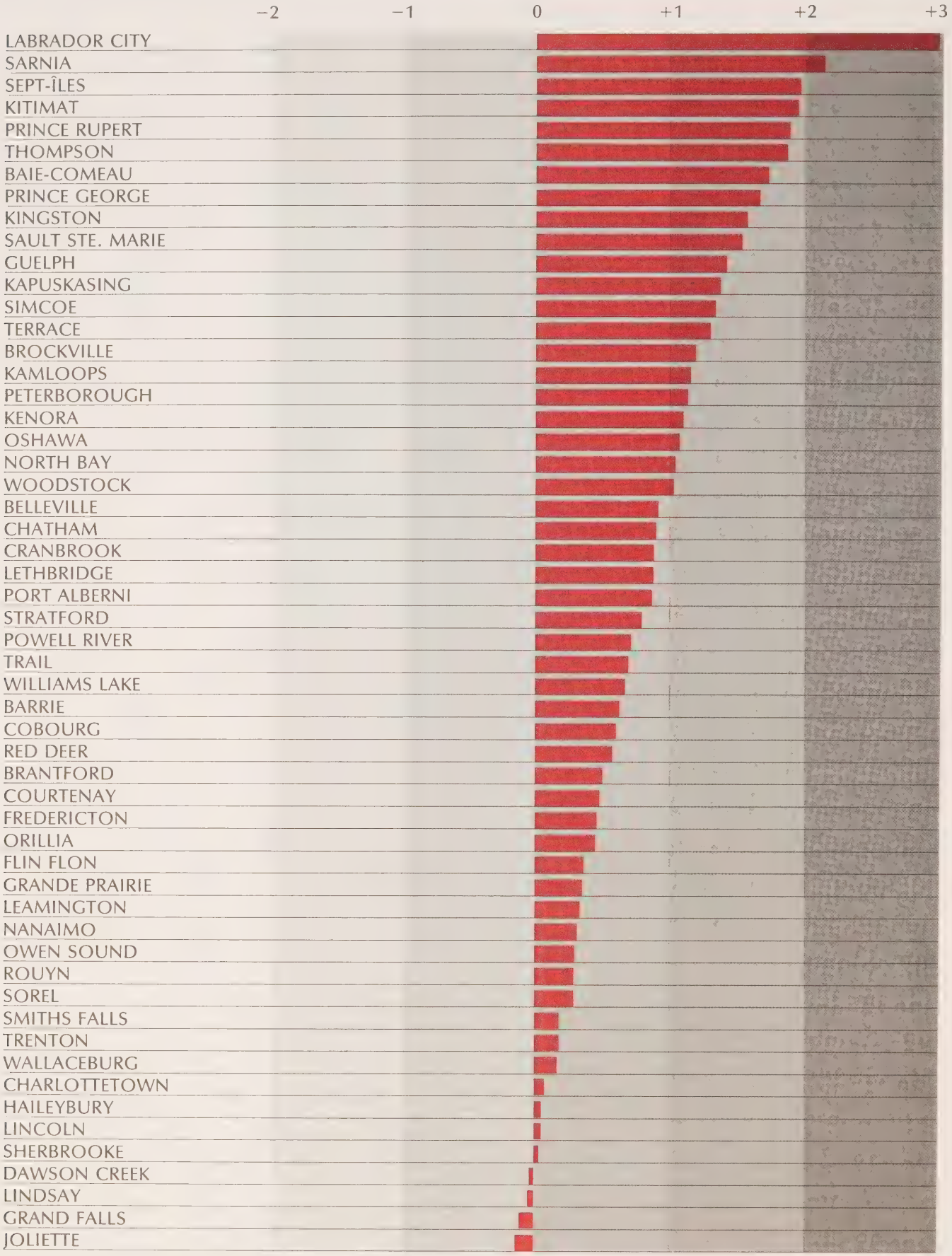
Alternative measures may be sought to remove the measurement difficulties inherent in "average family income". As was previously mentioned, using an average obscures the actual distribution of family incomes. More importantly, it hides the number of families whose incomes are low and are less likely to enjoy a high quality of life. Options which could be considered to rectify this situation include the development of summary measures of the income distribution. One possibility is to use the family income level which subsumes the first quartile of the community's families. As another option, consideration could be given to developing a justifiable poverty line and reporting the percentage of families falling below it. In both of these cases, there is a dearth of contemporary data. However, the income distribution of individual tax filers may be calculated from Revenue Canada data. A crude, low-income threshold may be determined for individual earners by calculating the annual income an individual would receive if he or she were paid the statutory minimum wage. This done, the percentage falling below the threshold can be used as a low-income indicator.

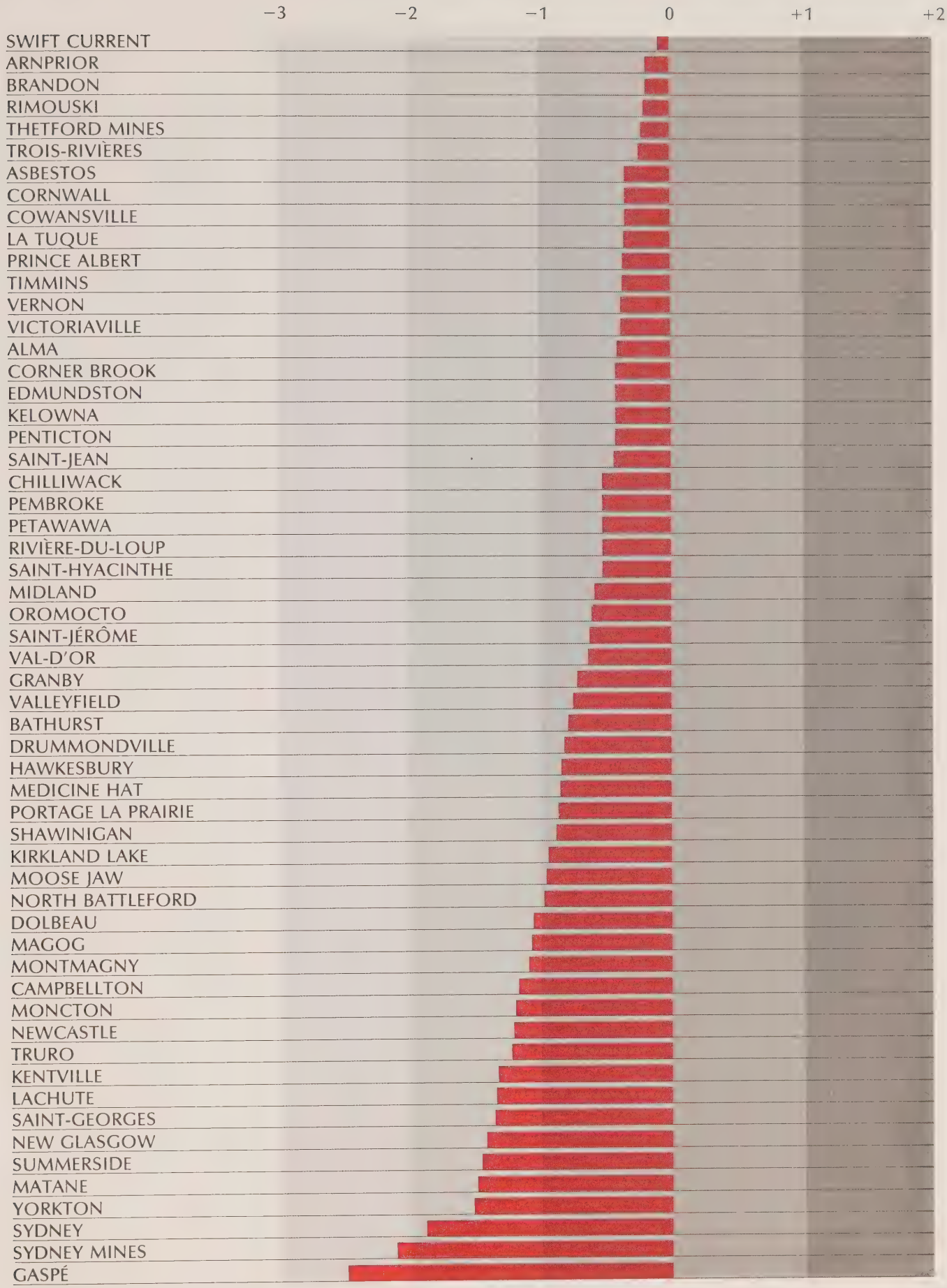
TABLE 39. FAMILY INCOME, 1971: PERCENTAGE OF AVERAGE FAMILY INCOME FOR URBAN CANADA ($10,502)

ATLANTIC REGION	Bathurst	80	Moncton*	77
	Campbellton*	77	Newcastle*	77
	Charlottetown*	89	New Glasgow*	79
	Corner Brook	84	Oromocto	82
	Edmundston	84	Summerside*	75
	Fredericton*	92	Sydney*	71
	Grand Falls*	87	Sydney Mines*	68
	Kentville*	76	Truro*	77
	Labrador City*	119		
QUÉBEC REGION	Alma	84	Rivière-du-Loup	83
	Asbestos*	85	Rouyn*	91
	Baie-Comeau*	104	Saint-Georges*	76
	Cowansville	85	Saint-Hyacinthe*	83
	Dolbeau*	78	Saint-Jean*	84
	Drummondville*	80	Saint-Jérôme*	82
	Gaspé	66	Sept-Îles	107
	Granby*	81	Shawinigan*	80
	Joliette*	87	Sherbrooke*	89
	Lachute*	76	Sorel*	91
	La Tuque	85	Thetford Mines*	86
	Magog*	78	Trois-Rivières*	86
	Matane	74	Val-d'Or*	82
	Montmagny	78	Valleyfield*	81
	Rimouski*	86	Victoriaville*	85
ONTARIO REGION	Arnprior*	86	Midland*	82
	Barrie*	94	North Bay	98
	Belleville	97	Orillia	92
	Brantford*	93	Oshawa*	98
	Brockville	100	Owen Sound	91
	Chatham	97	Pembroke*	83
	Cobourg*	94	Petawawa*	83
	Cornwall	85	Peterborough*	100
	Guelph*	101	Sarnia*	109
	Haileybury*	89	Sault Ste. Marie*	102
	Hawkesbury*	80	Simcoe	101
	Kapuskasing	101	Smiths Falls*	90
	Kenora*	98	Stratford	96
	Kingston*	102	Timmins*	85
	Kirkland Lake	79	Trenton*	90
	Leamington	91	Wallaceburg	90
	Lincoln	89	Woodstock	98
	Lindsay	88		
PRAIRIES REGION	Brandon	86	Portage la Prairie	80
	Flin Flon*	91	Prince Albert	85
	Grande Prairie	91	Red Deer	94
	Lethbridge	97	Swift Current	87
	Medicine Hat*	80	Thompson	106
	Moose Jaw	79	Yorkton	74
	North Battleford*	79		
BRITISH COLUMBIA REGION	Chilliwack*	83	Port Alberni*	97
	Courtenay*	92	Powell River	95
	Cranbrook	97	Prince George*	103
	Dawson Creek	88	Prince Rupert*	106
	Kamloops*	100	Terrace*	101
	Kelowna*	84	Trail*	95
	Kitimat	107	Vernon	85
	Nanaimo*	91	Williams Lake*	95
	Penticton	84		

NOTES: 1971 boundaries are used for all urban areas.
*Denotes Census Agglomeration as defined in 1971.
SOURCE: D.M. Ray (ed.), *Canadian Urban Trends: National Perspective, Volume One* (Toronto and Ottawa: Copp Clark in association with the Ministry of State for Urban Affairs, 1976), pp. 170-172.

GRAPH 37. FAMILY INCOME, 1971: PERCENTAGE OF AVERAGE FAMILY INCOME FOR URBAN CANADA ($10,502) (Z Scores)




−3
−2
−1
0
+1
+2
SWIFT CURRENT
ARNPRIOR
BRANDON
RIMOUSKI
THETFORD MINES
TROIS-RIVIÈRES
ASBESTOS
CORNWALL
COWANSVILLE
LA TUQUE
PRINCE ALBERT
TIMMINS
VERNON
VICTORIAVILLE
ALMA
CORNER BROOK
EDMUNDSTON
KELOWNA
PENTICTON
SAINT-JEAN
CHILLIWACK
PEMBROKE
PETAWAWA
RIVIÈRE-DU-LOUP
SAINT-HYACINTHE
MIDLAND
OROMOCTO
SAINT-JÉRÔME
VAL-D'OR
GRANBY
VALLEYFIELD
BATHURST
DRUMMONDVILLE
HAWKESBURY
MEDICINE HAT
PORTAGE LA PRAIRIE
SHAWINIGAN
KIRKLAND LAKE
MOOSE JAW
NORTH BATTLEFORD
DOLBEAU
MAGOG
MONTMAGNY
CAMPBELLTON
MONCTON
NEWCASTLE
TRURO
KENTVILLE
LACHUTE
SAINT-GEORGES
NEW GLASGOW
SUMMERSIDE
MATANE
YORKTON
SYDNEY
SYDNEY MINES
GASPÉ

ASPECT MEASURED

Just as low income can have severe effects on the quality of life an individual experiences, so too can unemployment. Prolonged unemployment is not only linked with losses in income and, thus, lower potential to purchase goods and services, but frequently with the loss of self-esteem as well. However, the severity of the economic and psychological consequences of unemployment will vary from person to person. In general, it would seem that young people will be less severely affected in that they are less likely to have dependants to support or to have major financial commitments to fulfill (e.g., house mortgage). Similarly, second-income earners in a family may be less significantly affected by unemployment in that they can fall back on their spouses' incomes to some extent.

Just as unemployment may result in a drop in the quality of life of individuals, so may unemployment affect the quality of life throughout the whole community. At a minimum, a high rate of unemployment may indicate a serious under-utilization of human potential. In this case, it is not that the quality of life in the community decreases but, rather, that it fails to achieve its potential. Further high rates likely mean a larger population which is dependent on the public for support. Federal support in the form of Unemployment Insurance helps to spread out the burden of supporting the unemployed. However, when unemployment extends beyond the period covered by Unemployment Insurance, many are forced to turn to the local social services for support. Finally, high rates of unemployment mean a reduction in the money flow within the community. As a consequence, businesses which depend on local trade are likely to experience financial difficulties (perhaps even to the extent that they must lay off workers).

The unemployment measure that will be utilized here is the percentage of the centre's labour force that was unemployed at the time of the 1976 Census. As defined by Statistics Canada, . . . the Unemployed includes persons not classified as employed who, in the week prior to enumeration,

(1) looked for work and were available to start work. As well, the Census Instruction Booklet asked persons who would have actively looked for work, but did not for certain specific reasons, to answer "Yes" to the "looking" questions. Those reasons were: temporary illness; indefinite layoff (exceeding 30 days) from a job to which they expected to be called back; or belief that no work was available in their community.

(2) were on temporary lay-off, not exceeding 30 days, from a job to which they expected to return (excluding full-time elementary and secondary school students); or

(3) had definite arrangements to start a new job at a future date (excluding full-time elementary and secondary school students).[6]

[6]Statistics Canada, *1976 Census of Canada, Labour Force Activity by Sex,* Cat. 94-801 (Ottawa: 1978), p. v.

DIFFICULTIES OF INTERPRETATION

Because the data refer to only one point in time, it is not possible to determine whether the rate indicates anomalous short-term unemployment or a constant situation (structural unemployment). Seasonal variations in employment opportunities and in the size of the labour force, as well as strikes and temporary lay-offs, may cause the measure to indicate inaccurately the more general pattern of unemployment.

Finally, it should be noted that the unemployment rate does not serve to indicate other important aspects of employment, such as underemployment and job satisfaction, which impinge on the quality of life.

URBAN PATTERN

The average unemployment rate for all non-metropolitan centres is 8.21. Unemployment is highest in Atlantic, Québec and British Columbia centres where the regional averages exceed 9 per cent. A slightly lower rate is found in Ontario centres where unemployment is near 7 per cent, while Prairie cities, on the whole, suffer from considerably less unemployment at 4.4 per cent.

Places with particularly severe unemployment include: (1) some of the older, specialized manufacturing centres in the hinterland (i.e., pulp and paper towns such as Corner Brook, Campbellton, Grand Falls, Shawinigan and Kirkland Lake); (2) declining industrial and mining centres (Sydney and Sydney Mines); and (3) remote centres based on primary resources (e.g., Gaspé).

Lower levels of unemployment are found in manufacturing towns near Montréal (Saint-Hyacinthe, Saint-Jean, Saint-Jérôme and Joliette), southern Ontario centres which have a mix of light manufacturing and agricultural service functions (e.g., Woodstock, Stratford and Lincoln) and in centres where residents can commute to work in metropolitan centres. Little unemployment is recorded among the Prairie communities specializing in transportation, wholesaling and retail functions for the agricultural hinterland (Lethbridge, Medicine Hat, Swift Current, Yorkton). Finally, it can be noted that centres with high unemployment frequently also have high rates of gross migration. Quite plausibly, high gross migration is often a function of out-migration resulting from an oversupply of labour.

a) Overall aggregate values — Unemployment rate (1976)

Mean ($\bar{X}$)	8.2
Standard deviation(S)	2.6
Maximum	16.7
Minimum	3.5

b) By region

	$\bar{X}$	S	N
Atlantic	9.8	2.4	17
Québec	9.5	2.6	30
Ontario	7.2	1.6	35
Prairies	4.4	0.8	13
British Columbia	9.6	1.6	17

OTHER MEASURES

Three types of alternative measures will be considered here: (1) more accurate summary measures based on existing data; (2) more detailed measures from existing data; (3) superior measures which could be developed if current data collection instruments were altered.

1) More Accurate Summary Measures

If one is interested in utilizing unemployment rates to compare centres' economic performance, it may be useful to standardize centres' rates so as to eliminate the effects of differences in demographic composition. The fact that certain groups (i.e., youth aged 16 - 25, women) are more prone to unemployment would seem to make such a procedure desirable. However, standardization has the disadvantage of obscuring the real hardship that occurs in communities. Because the focus in this study is more on the quality of life than on economic performance, standardized unemployment rates have not been utilized.

2) More Detailed Measures

Cross-tabulations of unemployment by sex, age group, education level and years of work experience in each community could be used to provide community profiles. Such profiles would, however, make the comparison of a large number of urban places difficult.

3) Superior Measures

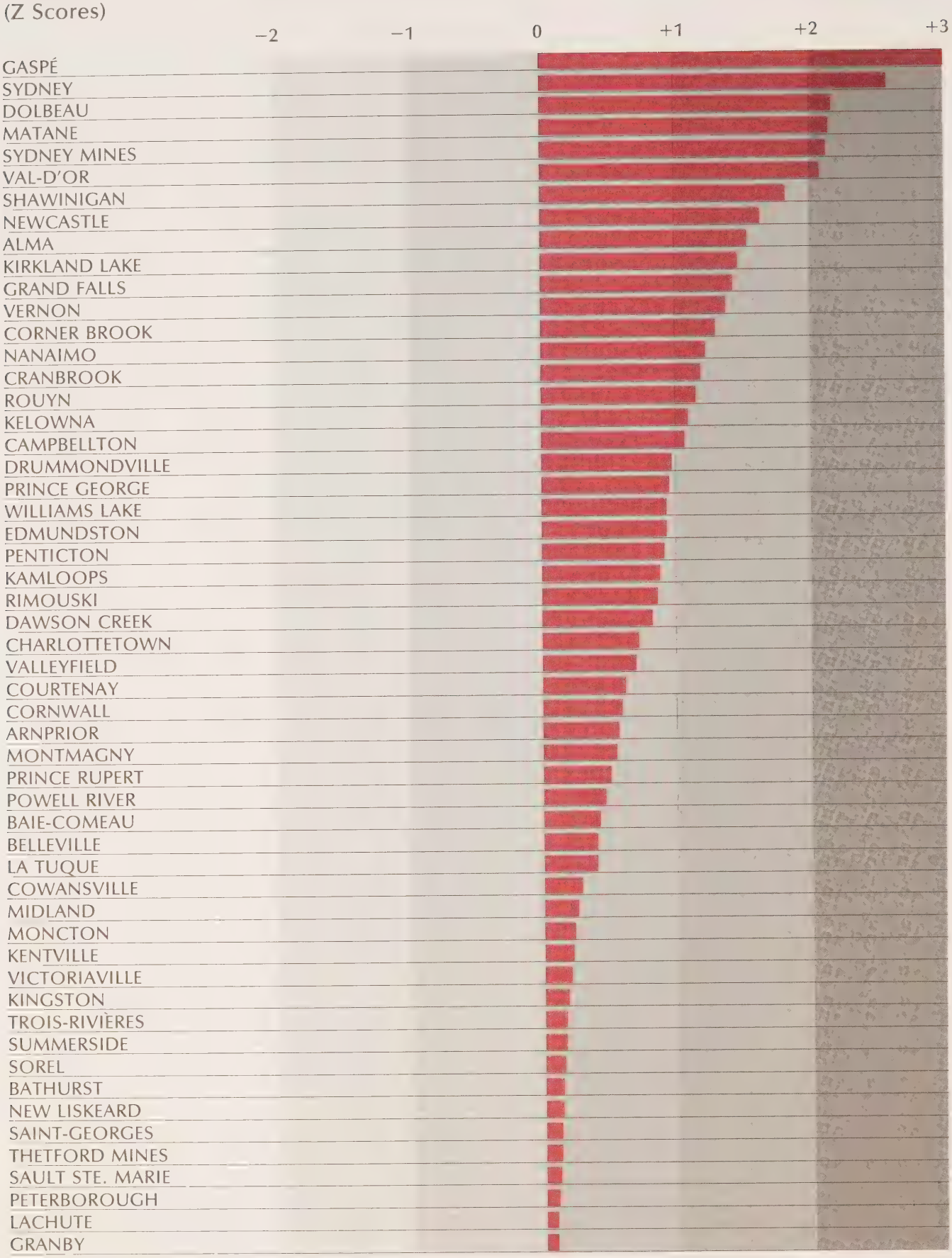
One of the major difficulties with the unemployment measure reported here is that it fails to distinguish seasonal, cyclical and structural unemployment. Ideally, more continuous monitoring of centres' unemployment rates is needed to differentiate these various types of unemployment. At present we have only the Labour Force Survey which provides data for a time series at the national, provincial and regional levels and for selected large metropolitan areas.

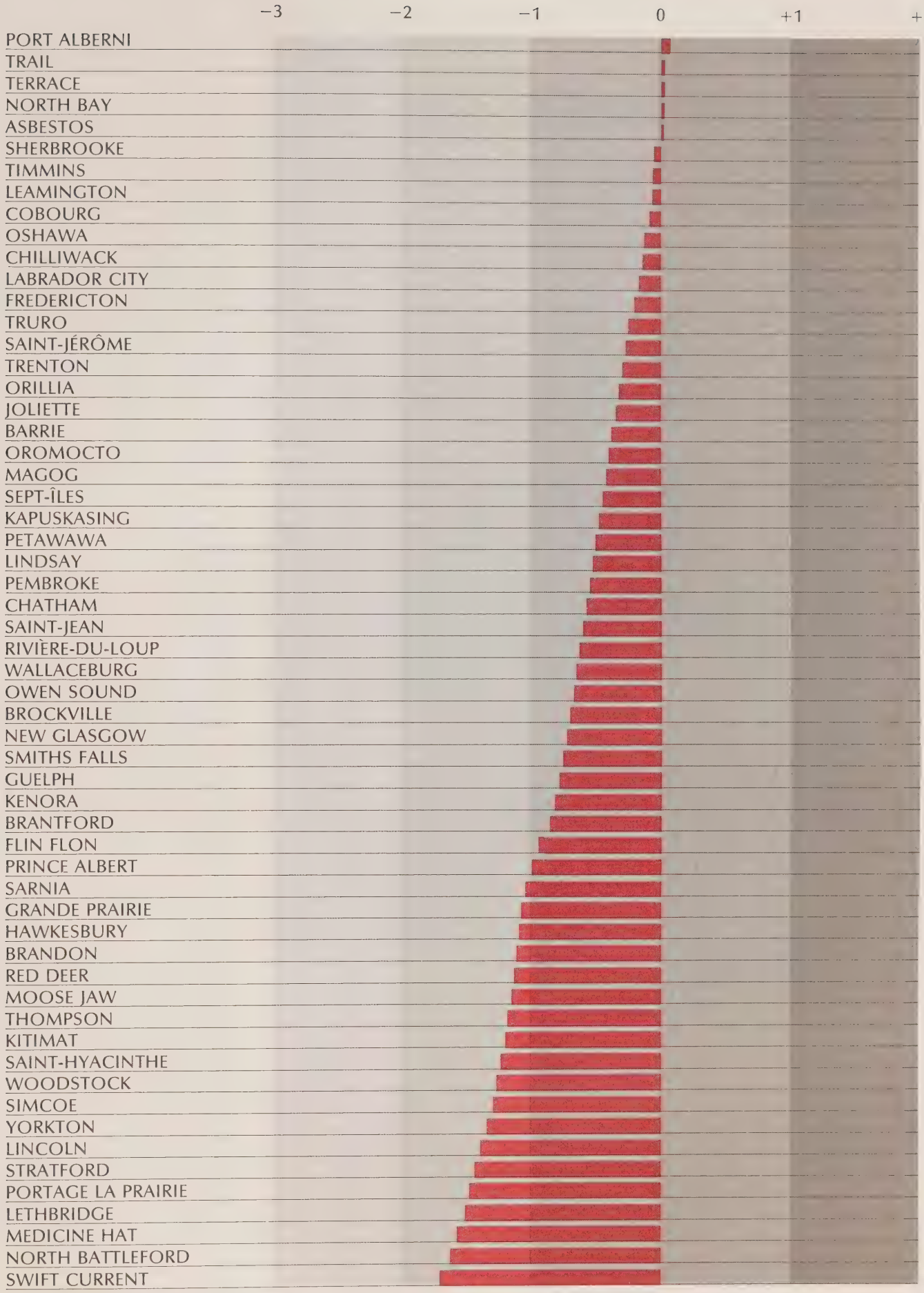
TABLE 40. UNEMPLOYMENT RATE (1976)

ATLANTIC REGION	Bathurst	8.6	Moncton*	8.8
	Campbellton	10.9	Newcastle+	12.4
	Charlottetown+	10.1	New Glasgow+	6.3
	Corner Brook	11.4	Oromocto	7.1
	Edmundston	10.5	Summerside	8.7
	Fredericton	7.5	Sydney*	15.0
	Grand Falls	12.0	Sydney Mines*	13.6
	Kentville	8.7	Truro*	7.4
	Labrador City	7.6		
QUÉBEC REGION	Alma	12.1	Rivière-du-Loup	6.7
	Asbestos	8.2	Rouyn*	11.1
	Baie-Comeau*	9.2	Saint-Georges+	8.5
	Cowansville	8.8	Saint-Hyacinthe*	4.9
	Dolbeau+	13.9	Saint-Jean*	6.7
	Drummondville*	10.6	Saint-Jérôme*	7.4
	Gaspé	16.7	Sept-Îles	7.0
	Granby*	8.3	Shawinigan*	12.8
	Joliette*	7.2	Sherbrooke*	8.1
	Lachute	8.4	Sorel*	8.6
	La Tuque	9.0	Thetford Mines*	8.5
	Magog	7.1	Trois-Rivières*	8.7
	Matane	13.7	Val-d'Or	13.5
	Montmagny	9.6	Valleyfield*	10.0
	Rimouski*	10.3	Victoriaville*	8.7
ONTARIO REGION	Arnprior	9.7	New Liskeard	8.5
	Barrie*	7.2	North Bay*	8.2
	Belleville	9.0	Orillia	7.3
	Brantford*	6.1	Oshawa*	7.7
	Brockville*	6.4	Owen Sound	6.5
	Chatham	6.8	Pembroke+	6.9
	Cobourg+	7.8	Petawawa+	6.9
	Cornwall	9.8	Peterborough*	8.4
	Guelph*	6.2	Sarnia*	5.5
	Hawkesbury	5.4	Sault Ste. Marie*	8.4
	Kapuskasing	7.0	Simcoe	4.5
	Kenora	6.2	Smiths Falls	6.3
	Kingston*	8.7	Stratford	4.3
	Kirkland Lake	12.0	Timmins	8.1
	Leamington	8.1	Trenton*	7.3
	Lincoln	4.3	Wallaceburg	6.6
	Lindsay	6.9	Woodstock	4.9
	Midland*	8.8		
PRAIRIES REGION	Brandon	5.3	Portage la Prairie	4.3
	Flin Flon	5.9	Prince Albert	5.6
	Grande Prairie	5.5	Red Deer	5.2
	Lethbridge	4.2	Swift Current	3.5
	Medicine Hat*	4.0	Thompson	5.0
	Moose Jaw*	5.1	Yorkton	4.4
	North Battleford	3.8		
BRITISH COLUMBIA REGION	Chilliwack	7.7	Port Alberni*	8.3
	Courtenay+	9.8	Powell River	9.3
	Cranbrook	11.1	Prince George	10.5
	Dawson Creek	10.2	Prince Rupert	9.4
	Kamloops	10.3	Terrace	8.2
	Kelowna	10.9	Trail	8.2
	Kitimat	3.0	Vernon	11.7
	Nanaimo	11.2	Williams Lake	10.5
	Penticton	10.4		

NOTES: 1976 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1976 boundaries).
+Includes adjoining municipalities with an urban population of 5000 or more (1976 boundaries).
In all the tables based on the 1971 Census of Canada, data are reported for Haileybury C.A. However, in 1971, this data was no longer available as Haileybury ceased to be listed as a C.A. Data is given instead for the town of New Liskeard which is the largest agglomeration in the area.
SOURCE: Statistics Canada, *1976 Census, Labour Force Activity*, Cat. 94-803 (Ottawa: 1978).

GRAPH 38. UNEMPLOYMENT RATE (1976)
(Z Scores)

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PORT ALBERNI
TRAIL
TERRACE
NORTH BAY
ASBESTOS
SHERBROOKE
TIMMINS
LEAMINGTON
COBOURG
OSHAWA
CHILLIWACK
LABRADOR CITY
FREDERICTON
TRURO
SAINT-JÉRÔME
TRENTON
ORILLIA
JOLIETTE
BARRIE
OROMOCTO
MAGOG
SEPT-ÎLES
KAPUSKASING
PETAWAWA
LINDSAY
PEMBROKE
CHATHAM
SAINT-JEAN
RIVIÈRE-DU-LOUP
WALLACEBURG
OWEN SOUND
BROCKVILLE
NEW GLASGOW
SMITHS FALLS
GUELPH
KENORA
BRANTFORD
FLIN FLON
PRINCE ALBERT
SARNIA
GRANDE PRAIRIE
HAWKESBURY
BRANDON
RED DEER
MOOSE JAW
THOMPSON
KITIMAT
SAINT-HYACINTHE
WOODSTOCK
SIMCOE
YORKTON
LINCOLN
STRATFORD
PORTAGE LA PRAIRIE
LETHBRIDGE
MEDICINE HAT
NORTH BATTLEFORD
SWIFT CURRENT

FEMALES IN THE LABOUR FORCE AS A PERCENTAGE OF THE TOTAL NUMBER OF FEMALES AGED 20-64 (1976)

ASPECT MEASURED

The presence of a job market which is open to all those willing and able to work can be seen to be a desirable community characteristic which contributes to the quality of life. When specific groups cannot find jobs which match their abilities, frustration and discontent are likely consequences. Further, when discrimination is a causal factor in the lack of job opportunities for particular groups, the productivity of the economy may fall behind its potential in that the best person for the job is not necessarily hired.

Women form one group of potential employees for whom access to the job market has been said to be highly restricted. The rate of female participation in the labour force will be used here to provide a crude measure of the openness of the job market to women, with the realization that what is the case for women is not necessarily the case for others desiring access to jobs.

It should be noted that the rate of female participation indicates more than the openness of the job market. The rate also reflects the degree to which women have rejected the traditional role of full-time mother and housewife in favour of a new role in which they seek the same work opportunities as men. In addition, the trend to smaller families coupled with the development of child care services such as daycare and "after 4" programs can also be seen to influence the rate of female participation in the labour force. It must be noted, however, that higher rates of female participation may be a function of economic necessity as well as of increased desire to work and the development of supportive services to working mothers. The high rates of inflation experienced through the 1970s have probably necessitated the entry of many women into the labour force in order to supplement family income.

The measure is based on data from the 1976 Census (Statistics Canada, 1978; Cat. No. 94-801). It is calculated by dividing the total number of women aged 20-64 in the labour force of each community by the total number of women aged 20-64 who reside in the centre. All women who were classified as employed or unemployed in the 1976 Census are included in the labour force.[7]

[7]For reference, Statistics Canada's definition of "Employed" and "Unemployed" are cited below:

(a) The employed consists of persons who, in the week prior to enumeration:
  (i) worked for pay or in their own business, farm or professional practice;
  (ii) helped without pay in a family business or farm; or
  (iii) had a job from which they were temporarily absent because of illness, vacation, labour dispute at their place of work, training course (provided the job was being held until trainee's return), bad weather, fire, personal reasons, etc.

(b) The unemployed includes persons not classified as employed who, in the week prior to enumeration:
  (i) looked for work and were available to start work. As well, the Census Instruction Booklet asked persons who would have actively looked for work, but did not for certain specific reasons, to answer "yes" to the "looking" question. Those reasons were: temporary illness; indefinite layoff (exceeding 30 days) from a job to which they expected to be called back; or belief that no work was available in their community;
  (ii) were on temporary lay-off, not exceeding 30 days, from a job to which they expected to return (excluding full-time elementary and secondary school students); or
  (iii) had definite arrangements to start a new job at a future date (excluding full-time elementary and secondary school students).

Statistics Canada, *1976 Census of Canada, Labour Force Activity by Sex*, Cat. 94-801 (Ottawa: 1978), p. v.

DIFFICULTIES OF INTERPRETATION

One problem of interpretation stems from the definition of women in the labour force. Unemployed females are counted as in the labour force. This is useful if the concern is with measuring women's desire to work, but limits the utility of the measure as an indicator of the accessibility to the job market.

A second problem is that the participation rate fails to reveal variations in the openness of the occupational structure. This is important in that it is well known that women are under-represented in a number of the more desirable occupational categories.

URBAN PATTERN

Female labour force participation rates in non-metropolitan centres range from a low of 33.1 per cent in Dolbeau to a high of 60.3 per cent in Stratford. The average rate for all centres is 49.3 per cent.

Examination of regional averages suggests that there are fewer job opportunities for women (or a smaller proportion of women motivated to work) in centres located in Québec, the Atlantic region and British Columbia) than exist in centres in Ontario and the Prairies. More specifically, average participation rates range from lows of 44.9 and 45.6 in the Altantic and Québec regions through 49.9 in British Columbia to highs of 52.6 and 53.1 in the Prairies and Ontario, respectively.

In part, the magnitude of the female labour force participation rate appears to be a function of the community's economic base. Cities dominated by heavy primary and extractive industries traditionally have fewer jobs which are suited to or desired by women. Consequently, these centres tend to have lower rates of female participation in the labour force. For example, mining towns such as Labrador City, Asbestos and Timmins have low rates as do the primary processing centres of Grand Falls, Campbellton, Sydney, Shawinigan and Sorel. Finally, as might be expected, female participation is also low in centres where military bases account for a large portion of employment.

In contrast, high rates of female participation in the labour force tend to be found in centres which have a diverse industrial base providing employment opportunities in light manufacturing, public administration, retailing and business services (e.g., Charlottetown, Sherbrooke, Guelph, Brandon, Swift Current and Red Deer).

More generally, higher rates of female participation appear to be associated with centres which have population compositions similar in nature to those of metropolitan centres. Thus, centres where the participation rate is high are more likely to have low youth dependency ratios, relatively high old age dependency ratios and a high degree of ethnic diversity.

Also interesting is the fact that female participation is associated with a variety of housing variables. Where greater proportions of women work or want to work, there is a tendency for a larger percentage of dwellings to be owner-occupied, for owner-occupied dwellings to be more valuable and for a small proportion of dwellings to be crowded (i.e., to have more than one person per room). In general, the quality of community housing stock appears to increase as the proportion of women in the labour force increases. It may be that women's incomes are being used to supplement their spouses' incomes in order to make greater expenditures on housing, or it may be that both female participation and housing quality are functions of a common factor such as economic prosperity.

a) Overall aggregrate values	Percentage of females aged 20-64 in labour force (1976)		
Mean ($\bar{X}$)	49.3		
Standard deviation(S)	6.2		
Maximum	60.3		
Minimum	33.1		
b) By region	($\bar{X}$)	S	N
Atlantic	44.9	6.9	17
Québec	45.6	5.1	30
Ontario	53.1	4.7	35
Prairies	52.6	3.4	13
British Columbia	49.9	5.5	17

OTHER MEASURES

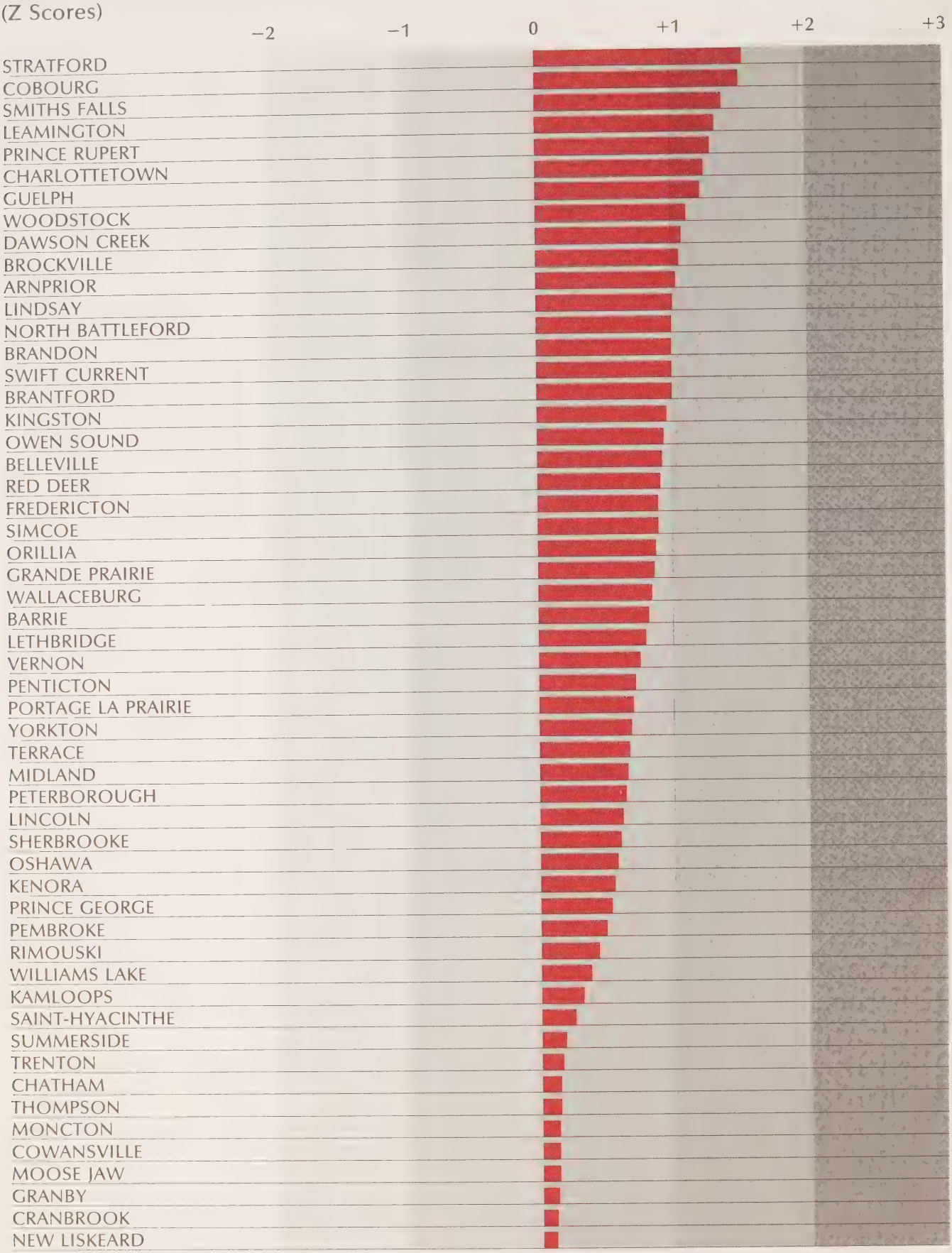
Alternative measures can be developed to focus on how women fare in the community labour force. For example, female participation rates can be used to facilitate comparative evaluation of women's employment opportunities while the average income of women in the labour force can serve to indicate the place of women in the status hierarchy of occupations. Finally, the ratio of employed females to all females in the labour force can be used as an alternative indicator of the openness of the occupational structure to women.

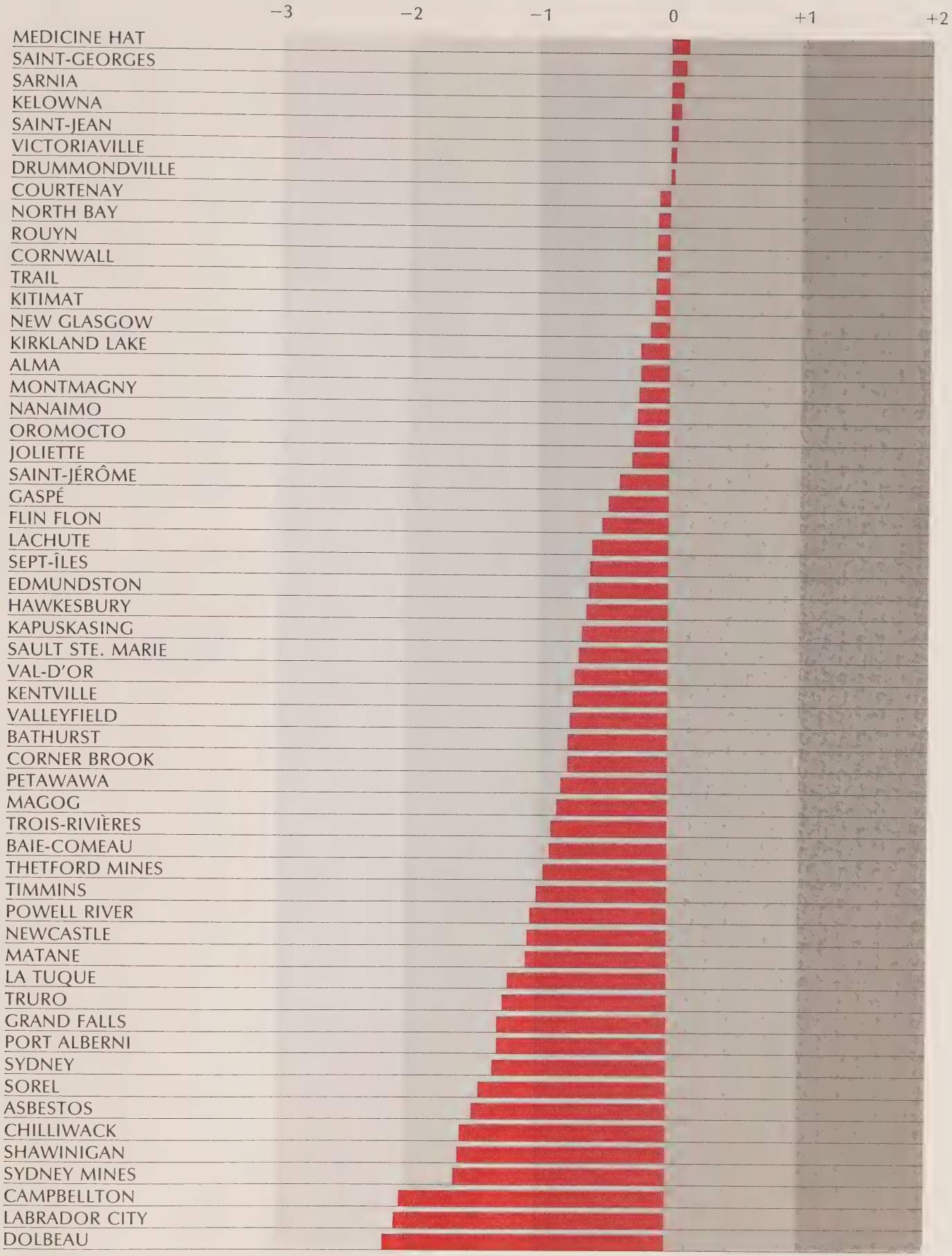
TABLE 41. PERCENTAGE OF FEMALES AGED 20-64 IN THE LABOUR FORCE (1976)

ATLANTIC REGION	Bathurst	44.6	Moncton*	50.9
	Campbellton	35.6	Newcastle+	46.3
	Charlottetown+	58.4	New Glasgow+	48.1
	Corner Brook	44.4	Oromocto	47.7
	Edmundston	45.8	Summerside	51.3
	Fredericton	55.3	Sydney*	39.2
	Grand Falls	39.8	Sydney Mines*	37.2
	Kentville	44.9	Truro*	40.2
	Labrador City	34.0		
QUÉBEC REGION	Alma	47.8	Rivière-du-Loup	34.2
	Asbestos	38.3	Rouyn*	48.8
	Baie-Comeau*	43.8	Saint-Georges+	50.4
	Cowansville	50.7	Saint-Hyacinthe*	51.6
	Dolbeau+	33.1	Saint-Jean*	49.9
	Drummondville*	49.3	Saint-Jérôme*	47.3
	Gaspé	46.9	Sept-Îles	45.9
	Granby*	50.6	Shawinigan*	37.6
	Joliette*	47.5	Sherbrooke*	52.8
	Lachute	45.9	Sorel*	38.8
	La Tuque	40.9	Thetford Mines*	43.3
	Magog	44.1	Trois-Rivières*	43.9
	Matane	46.3	Val-d'Or	45.2
	Montmagny	47.8	Valleyfield*	44.7
	Rimouski*	52.0	Victoriaville*	49.6
ONTARIO REGION	Arnprior	56.8	New Liskeard	50.5
	Barrie*	54.5	North Bay*	49.1
	Belleville	55.3	Orillia	54.8
	Brantford*	55.9	Oshawa*	52.7
	Brockville*	57.3	Owen Sound	55.4
	Chatham	51.1	Pembroke+	52.4
	Cobourg+	60.1	Petawawa+	44.2
	Cornwall	48.8	Peterborough*	55.3
	Guelph*	58.3	Sarnia*	50.2
	Hawkesbury	45.8	Sault Ste. Marie*	45.6
	Kapuskasing	45.6	Simcoe	54.8
	Kenora	52.6	Smiths Falls	59.6
	Kingston*	35.9	Stratford	60.3
	Kirkland Lake	47.9	Timmins	43.1
	Leamington	58.8	Trenton*	51.2
	Lincoln	53.2	Wallaceburg	54.6
	Lindsay	56.2	Woodstock	58.2
	Midland*	53.3		
PRAIRIES REGION	Brandon	56.1	Portage la Prairie	53.9
	Flin Flon	46.6	Prince Albert	45.3
	Grande Prairie	54.6	Red Deer	55.3
	Lethbridge	54.2	Swift Current	55.9
	Medicine Hat*	50.4	Thompson	50.9
	Moose Jaw*	50.6	Yorkton	53.9
	North Battleford	56.1		
BRITISH COLUMBIA	Chilliwack	37.7	Port Alberni*	39.8
	Courtenay+	49.2	Powell River	42.8
	Cranbrook	30.5	Prince George	52.5
	Dawson Creek	57.3	Prince Rupert	58.7
	Kamloops	51.6	Terrace	53.8
	Kelowna	49.9	Trail	48.5
	Kitimat	48.5	Vernon	54.1
	Nanaimo	47.8	Williams Lake	51.7
	Penticton	53.9		

NOTE: 1976 boundaries are used for all urban areas.
*Denotes Census Agglomeration (1976 boundaries).
+Includes adjoining municipalities with an urban population of 5000 or more (1976 boundaries).
In all the tables based on the 1971 Census of Canada, data are reported for Haileybury C.A. However, in 1976, this data was no longer available as Haileybury ceased to be listed as a C.A. Data is given instead for the town of New Liskeard which is the largest agglomeration in the area.
SOURCE: Statistics Canada, *1976 Census of Canada: Labour Force Activity,* Cat. 94-803 (Ottawa: 1978).

GRAPH 39. PERCENTAGE OF FEMALES AGED 20-64 IN THE LABOUR FORCE (1976)
(Z Scores)

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MEDICINE HAT
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SARNIA
KELOWNA
SAINT-JEAN
VICTORIAVILLE
DRUMMONDVILLE
COURTENAY
NORTH BAY
ROUYN
CORNWALL
TRAIL
KITIMAT
NEW GLASGOW
KIRKLAND LAKE
ALMA
MONTMAGNY
NANAIMO
OROMOCTO
JOLIETTE
SAINT-JÉRÔME
GASPÉ
FLIN FLON
LACHUTE
SEPT-ÎLES
EDMUNDSTON
HAWKESBURY
KAPUSKASING
SAULT STE. MARIE
VAL-D'OR
KENTVILLE
VALLEYFIELD
BATHURST
CORNER BROOK
PETAWAWA
MAGOG
TROIS-RIVIÈRES
BAIE-COMEAU
THETFORD MINES
TIMMINS
POWELL RIVER
NEWCASTLE
MATANE
LA TUQUE
TRURO
GRAND FALLS
PORT ALBERNI
SYDNEY
SOREL
ASBESTOS
CHILLIWACK
SHAWINIGAN
SYDNEY MINES
CAMPBELLTON
LABRADOR CITY
DOLBEAU

APPENDIX

DESCRIPTIVE STATISTICS: QUALITY OF LIFE INDICATORS FOR URBAN PLACES OF 10 000 – 100 000 POPULATION IN CANADA

VARIABLE	MEAN	STANDARD DEVIATION	MAXIMUM	MINIMUM
A. CONTEXTUAL VARIABLES				
Demographic Context				
- Percentage Population Change (1971-76)	4.90	10.30	43.30	-11.40
- Youth Dependency Ratio (1976)	0.40	0.05	0.59	0.28
- Old Age Dependency Ratio (1976)	0.14	0.05	0.30	0.01
- Population Turnover (1966-71)	0.42	0.15	0.90	0.20
- Index of Ethnic Diversity (1971)	0.42	0.23	0.77	0.02
Climatic Context				
- Annual Hours of Sunshine (Mean 1941-70)	1899.5	195.9	2387.0	1036.0
- Annual Days of Precipitation (Mean 1941-70)	138.1	27.9	227.0	69.0
- Annual Days of Snowcover (Mean 1941-60)	112.0	40.4	190.0	0.0
- July Temperature (^{0}C) (Mean 1941-70)	18.9	1.8	22.5	12.8
- January Temperature (^{0}C) (Mean 1941-70)	-9.8	5.4	3.2	-21.9
Economic/Geographic Context				
- Value of Building Permits: Average Value per Person (1974-76) ($)	542.7	294.7	2117.0	83.0

VARIABLE	MEAN	STANDARD DEVIATION	MAXIMUM	MINIMUM
B. QUALITY OF LIFE INDICATORS				
Physical Development				
Housing:				
- Average Value of Owner-Occupied Dwellings (1976 est.) ($)	26855.0	5925.0	40686.0	13247.0
- Percentage of Dwellings Owner-Occupied (1976)	62.0	9.7	85.1	15.9
- Crowded Dwellings: Percentage of Occupied Dwellings with 1.1 or more Persons per Room (1971)	10.5	4.8	22.0	4.0
Transportation:				
- Public Transportation (Ridership): Annual Fare Passengers Carried per Capita (1974)	30.0	14.8	70.7	4.1
- Public Transportation: Annual Revenue Vehicle kilometres per Capita (1974)	15.1	6.0	28.0	4.7
Social Development				
Education:				
- Educational Achievement: Percentage Aged 20-34 with Grade 10 or Less (1971)	45.5	9.2	67.0	25.0
- Pupil/Teacher Ratio: Elementary and Secondary Schools (1974-75)	19.5	1.5	22.5	15.3

VARIABLE	MEAN	STANDARD DEVIATION	MAXIMUM	MINIMUM
Health:				
- Hospital Beds: Rated Capacity per 1000 Population (1976)	11.0	5.0	26.0	3.0
- Physicians: General Practitioners per 1000 Population (1975)	1.1	0.5	2.9	0.2
- Infant Mortality: Deaths per 10 000 Population, Annual Average (1972-74)	3.0	1.5	13.1	0.6
Recreation, Leisure and Culture:				
- Socio-Cultural Facilities: Guttman Scale Index of Facility Provision (1972)	6.0	2.1	10.0	1.0
- Recreational and Leisure Facilities: Guttman Scale Index of Facility Provision (1974)	8.4	3.6	16.0	3.0
- Public Library Usage: Books Loaned per 1000 Population (1972)	7151.0	6589.0	29969.0	0.0
- Exhibition Halls, Museums and Galleries: Exhibit Area (square metres) per 1000 Population (1972)	40.3	89.8	684.9	0.0
Safety/Physical Security:				
- Violent Crimes per 1000 Population: Annual Average (1973-75)	5.3	3.5	15.6	0.2
- Robberies per 1000 Population: Annual Average (1973-75)	0.3	0.3	1.4	0.0
- Serious Property Crimes per 1000 Population: Annual Average (1973-75)	15.3	7.4	38.7	0.2
- Persons Injured in Motor Vehicle Accidents per 1000 Population: Annual Average (1973-75)	6.6	3.0	15.4	0.3
- Dangerous and Drunken Driving Offences per 1000 Population: Annual Average (1973-75)	8.1	5.9	29.0	0.0
- Police Manpower per 1000 Population (1974)	1.4	0.3	2.3	0.2
- Average Annual Fire Losses: Dollars per Person (1966-75)	13.6	9.3	77.4	2.2

VARIABLE	MEAN	STANDARD DEVIATION	MAXIMUM	MINIMUM
Community Media:				
- Number of Cable TV Channels Received (1975)	5.5	4.5	17.0	0.0
- Local Newspaper Circulation: Copies per Week per 1000 Population (1975)	1532.0	1347.0	7080.0	0.0
Economic Development				
Income:				
- Average Disposable Income after Federal and Provincial Taxes for all Tax Filers (1974) ($)	6481.3	673.4	8914.0	5205.0
- Family Income, 1971: Percentage of Average Family Income for Urban Canada ($10,502)	88.3	9.7	119.0	66.0
Labour Force:				
- Unemployment Rate (1976)	8.2	2.6	16.7	3.5
- Percentage of Females aged 20-64 in the Labour Force (1976)	49.3	6.2	60.3	33.1

DESCRIPTIVE STATISTICS: QUALITY OF LIFE INDICATORS FOR URBAN PLACES 10 000 – 100 000 POPULATION IN FIVE MAJOR REGIONS THROUGHOUT CANADA

VARIABLE	ATLANTIC REGION		QUÉBEC REGION		ONTARIO REGION		PRAIRIES REGION		BRITISH COLUMBIA REGION	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
A. CONTEXTUAL VARIABLES										
Demographic Context										
- Percentage Population Change (1971-76)	3.30	12.30	2.60	6.80	4.00	7.20	6.20	12.80	11.50	14.30
- Youth Dependency Ratio (1976)	0.45	0.06	0.31	0.04	0.39	0.03	0.40	0.06	0.42	0.06
- Old Age Dependency Ratio (1976)	0.14	0.06	0.11	0.03	0.16	0.05	0.16	0.06	0.12	0.07
- Population Turnover (1966-71)	0.40	0.22	0.32	0.07	0.42	0.13	0.52	0.10	0.53	0.11
- Index of Ethnic Diversity (1971)	0.32	0.13	0.15	0.10	0.50	0.14	0.69	0.06	0.66	0.07
Climatic Context										
- Annual Hours of Sunshine (Mean 1941-70)	1784.1	104.9	1868.3	134.4	1964.8	121.7	2165.2	131.1	1732.7	256.7
- Annual Days of Precipitation (Mean 1941-70)	154.8	25.4	147.4	17.7	133.5	17.8	100.6	16.4	142.1	40.5
- Annual Days of Snowcover (Mean 1941-60)	120.6	24.2	134.0	17.9	101.3	33.5	133.5	31.2	61.1	59.4
- July Temperature (^{0}C) (Mean 1941-70)	18.2	1.6	18.9	1.8	20.0	1.4	18.5	1.3	17.8	2.2
- January Temperature (^{0}C) (Mean 1941-70)	-8.3	4.2	-12.2	2.8	-9.2	4.2	-16.7	3.6	-3.9	5.7
Economic/Geographic Context										
- Value of Building Permits: Average Value per Person (1974-76) ($)	442.8	272.8	421.6	183.3	473.3	136.5	880.3	481.8	743.5	291.8

VARIABLE	ATLANTIC REGION		QUÉBEC REGION		ONTARIO REGION		PRAIRIES REGION		BRITISH COLUMBIA REGION	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
B. QUALITY OF LIFE INDICATORS										
Physical Development										
Housing:										
- Average Value of Owner-Occupied Dwellings (1976 est.) ($)	23384.0	6912.0	24039.0	3361.0	29632.0	5617.0	24951.0	5750.0	31034.0	4173.0
- Percentage of Dwellings Owner-Occupied (1976)	61.1	14.2	54.2	7.9	64.6	6.6	65.6	5.4	68.5	5.0
- Crowded Dwellings: Percentage of Occupied Dwellings with 1.1 or more Persons per Room (1971)	14.0	4.8	14.1	2.9	7.3	3.1	8.1	4.2	8.9	4.1
Transportation:										
- Public Transportation:(Ridership) Annual Fare Passengers Carried per Capita (1974)	25.5	23.0	28.8	2.3	29.7	15.8	40.8	5.1	14.6	3.5
- Public Transportation: Annual Revenue Vehicle kilometres per Capita (1974)	12.4	6.0	13.4	6.6	15.0	5.8	20.1	5.5	12.4	7.9
Social Development										
Education:										
- Educational Achievement: Percentage Aged 20-34 with Grade 10 or Less (1971)	46.7	6.2	54.4	5.8	45.4	7.2	35.9	6.0	36.4	6.0

VARIABLE	ATLANTIC REGION		QUÉBEC REGION		ONTARIO REGION		PRAIRIES REGION		BRITISH COLUMBIA REGION	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD D
- Pupil/Teacher Ratio: Elementary and Secondary Schools (1974-75)	19.5	2.0	—	—	19.1	1.5	19.8	0.6	19.9	1
Health:										
- Hospital Beds: Rated Capacity per 1000 Population (1976)	12.0	5.0	12.0	6.0	11.0	4.0	13.0	4.0	10.0	4
- Physicians: General Practitioners per 1000 Population (1975)	1.3	0.6	0.7	0.2	1.2	0.4	1.6	0.5	1.2	0
- Infant Mortality: Deaths per 10 000 Population, Annual Average (1972-74)	3.2	1.3	2.7	1.0	2.5	0.8	3.3	1.2	3.0	1
Recreation, Leisure and Culture:										
- Socio-Cultural Facilities: Guttman Scale Index of Facility Provision (1972)	4.8	1.9	5.3	2.5	6.5	2.1	7.1	1.3	6.6	1.
- Recreational and Leisure Facilities: Guttman Scale Index of Facility Provision (1974)	8.4	4.0	7.9	3.0	9.1	3.6	8.8	4.1	7.9	3.
- Public Library Usage: Books Loaned per 1000 Population (1972)	6340.0	5252.0	3490.0	5032.0	7866.0	5419.0	12274.0	10242.0	8589.0	6666.
- Exhibition Halls, Museums and Galleries: Exhibit Area (square metres) per 1000 Population (1972)	37.8	44.2	30.6	64.1	47.0	116.9	81.8	139.4	14.3	12.

ARIABLE	ATLANTIC REGION		QUÉBEC REGION		ONTARIO REGION		PRAIRIES REGION		BRITISH COLUMBIA REGION	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
afety/Physical Security:										
Violent Crimes per 1000 Population: Annual Average (1973-75)	3.5	1.6	2.4	1.4	6.0	3.3	7.3	3.5	9.3	2.9
Robberies per 1000 Population: Annual Average (1973-75)	0.2	0.2	0.5	0.4	0.3	0.3	0.2	0.2	0.5	0.4
Serious Property Crimes per 1000 Population: Annual Average (1973-75)	9.8	3.8	12.7	6.2	14.9	4.4	16.0	5.6	26.2	7.7
Persons Injured in Motor Vehicle Accidents per 1000 Population: Annual Average (1973-75)	3.5	2.1	6.8	3.3	7.8	2.3	7.2	3.7	6.2	1.5
Dangerous and Drunken Driving Offences per 1000 Population: Annual Average (1973-75)	6.5	5.4	4.0	2.4	9.1	4.7	10.8	4.9	15.9	4.8
Police Manpower per 1000 Population (1974)	1.6	0.5	1.5	0.4	1.5	0.2	1.4	0.2	1.4	0.4
Average Annual Fire Losses: Dollars per Person (1966-75)	14.2	10.3	11.3	3.8	12.8	5.4	11.3	5.8	20.2	17.8
ommunity Media:										
Number of Cable TV Channels Received (1975)	3.5	3.0	6.4	4.4	7.8	5.0	1.2	2.0	4.1	2.6
Local Newspaper Circulation: Copies per week per 1000 Population (1975)	1846.0	1535.0	774.0	830.0	1934.0	1588.0	2167.0	996.0	1244.0	964.0
conomic Development										
ncome:										
Average Disposable Income After Federal and Provincial Taxes for all Tax Filers (1974) ($)	6206.9	734.3	6330.6	537.5	6272.3	525.2	6586.5	456.4	7353.6	536.2
Average Family Income: Percentage of Mean for Urban Canada (1971)	81.8	11.5	83.8	7.9	93.0	7.3	86.8	8.9	94.3	7.7
abour Force:										
Unemployment Rate (1976)	9.8	2.4	9.5	2.6	7.2	1.6	4.4	0.8	9.6	1.6
Percentage of Females Aged 20-64 in the Labour Force (1976)	44.9	6.9	45.6	5.1	53.1	4.7	52.6	3.4	49.9	5.5

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